CHAPTER 4

LR-1 LIFERAFT ASSEMBLY

Section 4-1. Description

4-1. GENERAL.

4-2. The LR-1 is a one-man liferaft utilized with various soft and hard type survival kits. It is intended for use by an aircrewmember forced down at sea. It can also be used when forced down over land for fording rivers and streams or as shelter. See figures 4-1 through 4-6.

NOTE

The CNO has established new survival equipment lists as standards to be utilized by all concerned. These lists provide for an effective 24-hour survival capability and are incorporated in this chapter.

4-3. CONFIGURATION.

4-4. The LR-1 liferaft assembly consists of a inflation assembly (CO_2 cylinder and inflation valve) and a one-man liferaft constructed of polychloroprene-coated cloth. Three types of CO_2 cylinders and one type of inflation valve, FLU-6/P or modified FLU-6/P is available. The liferaft consists of a single compartment flotation tube with a non-inflatable floor. It is blue in color and features a weathershield, sea anchor, sea anchor pocket, retaining line pocket, and ballast bags. The weathershield is nonspecular sea blue in color on the outside and bright red on the inside. The survival items which may be required in LR-1 liferaft assemblies are listed for reference only in table 4-1, and most must be individually requisitioned.

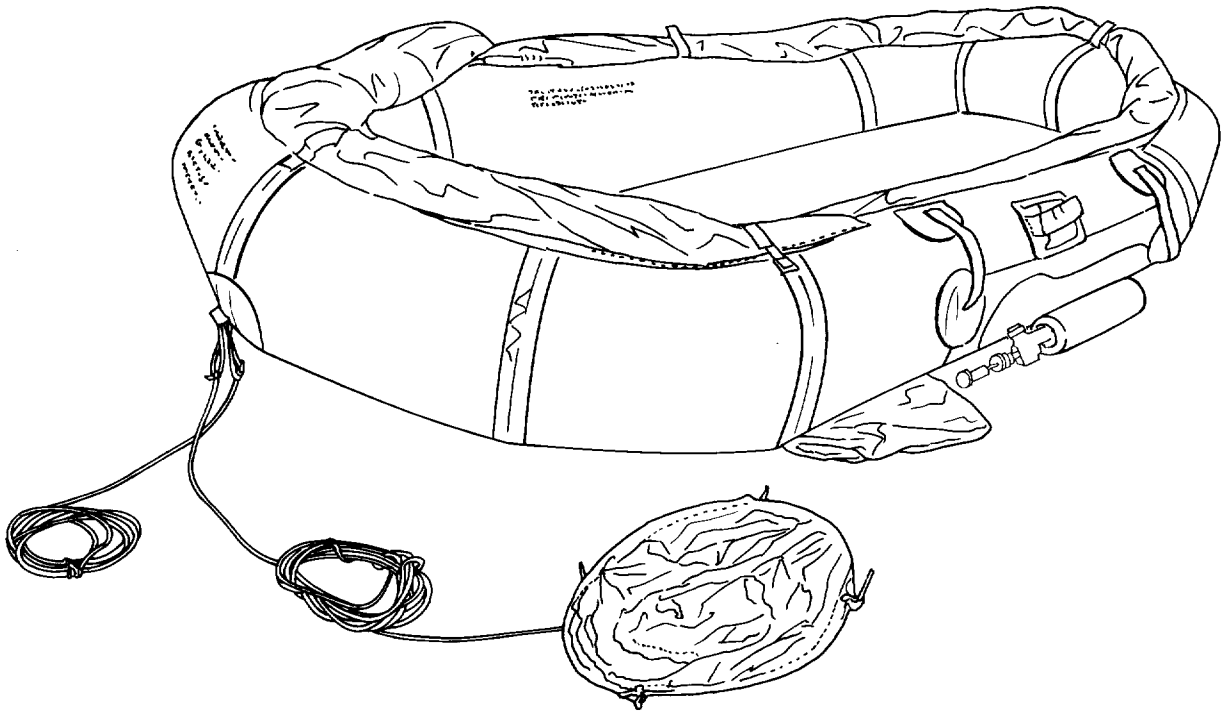

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Figure 4-1. LR-1 Liferaft Assembly

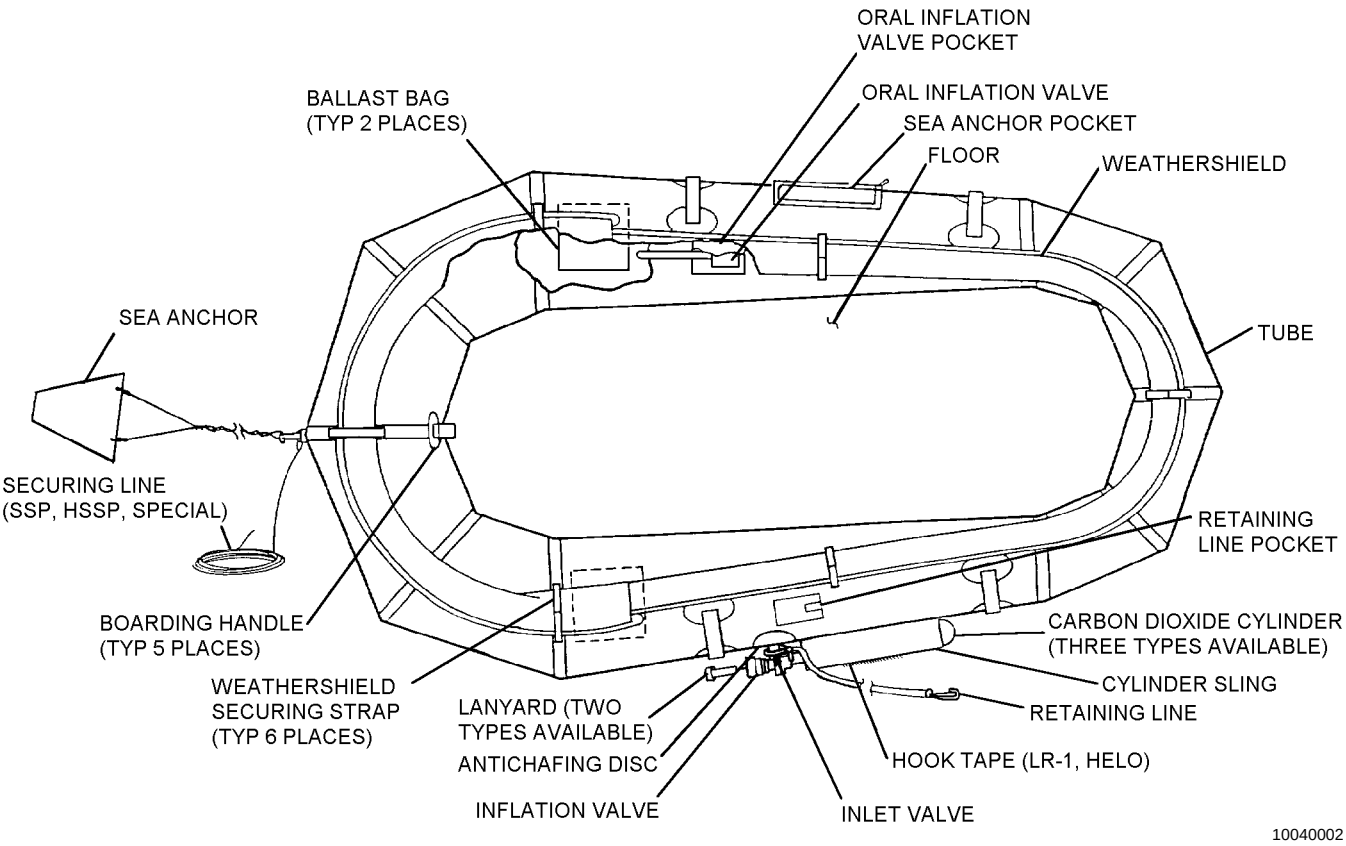

Figure 4-2. LR-1 Liferaft Assembly, Parts Nomenclature

4-5. APPLICATION.

4-6. The type of packaged LR-1 liferaft assembly used aboard various types of aircraft is shown in table 4-2.

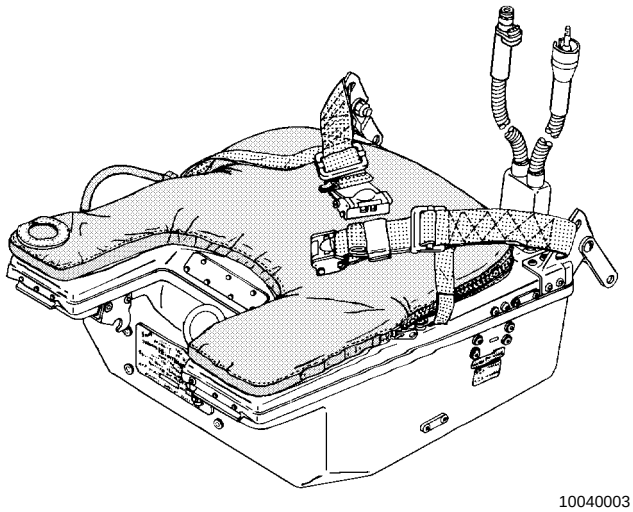

Figure 4-3. Typical Rigid Seat Survival Kit

4-7. FUNCTION.

4-8. The LR-1 liferaft assembly is inflated either manually by pulling the inflation assembly actuating lanyard or automatically on LR-1 (RSSK) by gravity drop on kit actuation. The inflation assembly inflates the flotation tube. After boarding, the LR-1 may be topped off by using the oral inflation valve.

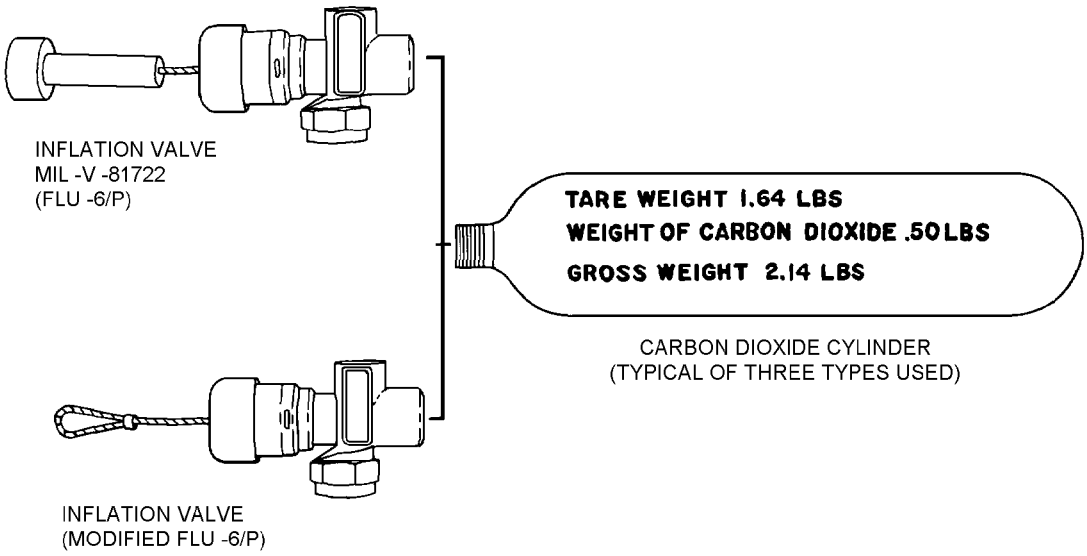

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Figure 4-4. Alternate Inflation Valve Assemblies

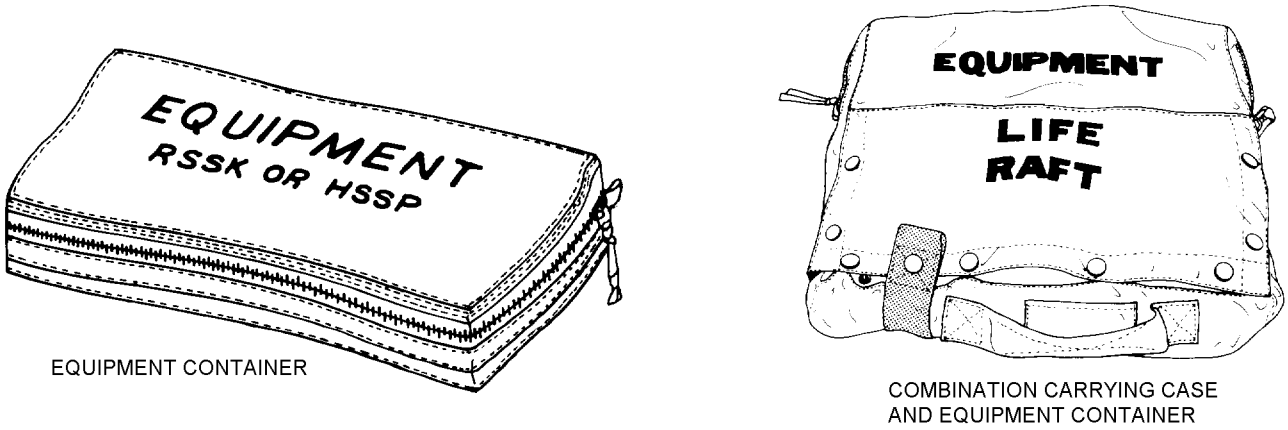

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Figure 4-5. Equipment Container and Combination Carrying Case and Equipment Container

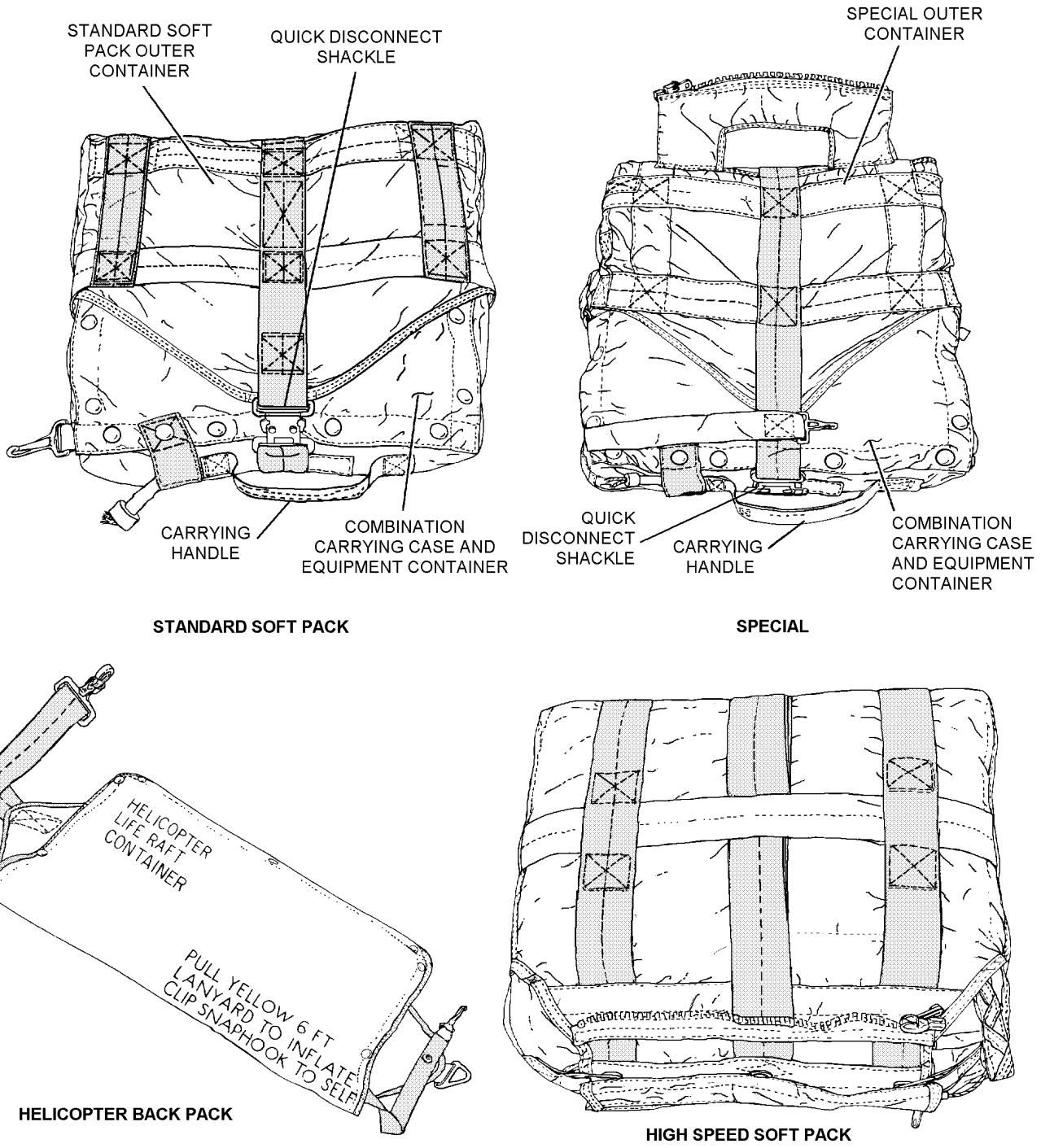

Figure 4-6. Packaged LR-1 Liferaft Assemblies

Table 4-1. LR-1 Survival Items

Description	Quantity Required	Reference Number	NIIN	SM&R Code
Dye Marker	2	MIL-S-17980	00-270-9986	PAOZZ
Distress Signal, MK-124 MOD 0	2	—	01-030-8330	
Emergency Radio Beacon AN/URT-33A	1	MIL-B-38401A	00-160-2136	PAOGG
Battery Power Supply (Note 3)	1	P/N A3-03-0052 (CAGE 18560)	00-168-8628	PAOZZ
Water, Drinking, Bagged, Emergency (Note 2)	3		01-124-4543	PAOZZ
Cord, Nylon, Utility, 50 feet	1	MIL-C-5040	00-262-2148	PAOZZ
SRU-31/P Individual Survival Kit (Part 1 - Medical, Part 2 - General)	1	MIL-S-81941	00-478-6504	PCOZZ
Ground Air Emergency Code Manual	1	NAVAIR 00-25-213	0800-LP-000-1500	—
Combat Casualty Blanket Type II, 3 oz.	1	MIL-B-36964	00-935-6666	PAOZZ
Bailing Sponge	1	P/N L-S-626 (CAGE 81348)	00-240-2555	PAOZZ
Personnel Lowering Device (Note 1)	1	CL213D2-1	00-451-3324	

Notes:
1. Optional item.
2. Deleted.
3. Refer to NAVAIR 16-30URT33-1 for battery service life.

Table 4-2. LR-1 Aircraft Applications

Packaged LR-1 Liferaft Assembly	Aircraft		
Standard Soft Pack Assembly (Note 1)	C-2A E-2A E-2B	E-2C T-34B	KC-130F KC-130R
High Speed Soft Pack Assembly	A-4B A-4C A-4E	KC-130F KC-130R	
High Speed Soft Pack (Modified) Assembly	T-39E	CT-39G	
Rigid Seat Survival Kit 1/1A	F-4B F-4J	F-4K F-4M	F-4N RF-4B
Rigid Seat Survival Kit 3	T-2		
Rigid Seat Survival Kit 8/8A	A-4F A-4M A-7C	TA-4J A-7A TA-4F	A-7E S-3A A-7B
Helicopter Back Pack Assembly (Note 2)	All Helicopters (except AH-1 series)		
SKU-2/A (Note 2)	F-14 KA-6D	A-6E EA-6A	EA-6B
SKU-3/A (Note 2)	F-18		
SKU-4/A	A-7		
SKU-6/A	AV-8B	TAV-8B	
SKU-12/A (Note 3)	A-6E KA-6D	EA-6A EA-6B	F-14

NOTE:
1. E-2 Aircraft equipped with the A/P22P-11 Crew Backpack utilize the LRU-18/U One Man Vee Bottom Liferaft.
2. LR-1 Liferafts will be replaced with LRU-18/U One Man Vee Bottom Liferaft in Helicopter Back Pack Assemblies on an attritional basis.
3. The LRU-23/P Liferaft Assembly is installed in seat survival kits used in F-14 and F/A-18 aircraft equipped with SJU-17(V)1A through SJU-17(V)4A ejection seats.

Section 4-2. Modifications

4-9. GENERAL.

4-10. There are no authorized modifications to the LR-1 liferaft assembly at this time. Common repairs and fabrications are listed in table 4-3.

Table 4-3. LR-1 Common Repairs and Fabrications

Description of Repair or Fabrication	Paragraph Number
Determination of Repairability	4-46
Cementing Liferafts	4-47
Patching Liferafts	4-48
Recementing or Replace Seam Tapes	4-49
Sea Anchor/Mooring Line Replacement	4-50
Fabrication of Antichafing Disc	4-52
Fabrication of Retaining Line	4-53
Fabrication of Boarding Handle Assembly	4-54
Replacement of Securing Line	4-55 (Note 1)
Replacement of MIL-V-25492 Inflation Valve with MIL-V-81722 (FLU-6/P) Inflation Valve	4-56 (Note 2)
Installation of Hook Tape on Cylinder Sling	4-57 (Note 3)
Modification of CO_2 Inflation System	4-58 (Note 3)
Modification of FLU-6/P used on RSSK Systems	4-59 (Note 2)
Modification of HSSP and Cylinder Sling	4-60 (Note 4)
Repair of Helo-Backpack Carrying Case	4-60A
Replacement of Oral Inflation Valve	4-61

Notes:
1. Used with HSSP, SSP and Special Soft Pack
2. Used with RSSK Installation
3. Used with HELO Back Pack
4. Used in T-39 Aircraft

Section 4-3. Maintenance

4-11. GENERAL.

4-12. This section contains information on inspection, disassembly, repair/replacement, testing, and reassembly of the LR-1 liferaft.

4-13. INSPECTION.

4-14. All liferaft assemblies shall be subjected to the following inspections: Place-In-Service, Daily/Pre-Flight, Special, Phase/Isochronal Scheduled Inspection System and Acceptance Inspections.

NOTE

Refer to NAVAIR 13-1-6.3-1 and 13-1-6.3-2, Seat Survival Kits, for inspection requirements for Rigid Seat Survival Kits (RSSK).

4-14A. The Place-In-Service Inspection shall be performed on all new assemblies or assemblies being returned from vendor repair or overhaul. The Aircraft Intermediate Maintenance Department performs this inspection.

4-15. The Daily/Preflight Inspection shall be performed on fuselage-installed liferafts prior to first flight of the day. This inspection shall be performed by line personnel (plane captain or delegated aircrewmember) who have been designated by the line division officer, instructed and found qualified by the Aviator's Equipment Branch.

4-16. Special Inspections performed on aircraft installed liferafts shall coincide with the Periodic Maintenance Requirements of the aircraft on which they are installed, not to exceed 36 days.

4-17. All liferafts shall be subjected to Phase/Isochronal Scheduled Inspection System (ISIS) inspections coinciding with the aircraft on which they are installed, with the exception of the Helicopter Backpack which shall be inspected every 360 days. The Phase/ISIS inspections shall be performed by the intermediate level of maintenance or above.

4-18. QUALITY ASSURANCE. The procedures detailed present a logical sequence for proper inspection. Quality assurance steps are provided for critical operations. When a step is underlined, the Aircrew Survival Equipmentman shall perform the operation, then have performance verified by a Quality Assurance Representative (CDI, CDQAR, or QAR) prior to proceeding to the next operation. Work center supervisors are primarily responsible for quality assurance and in accordance with OPNAVINST 4790.2 Series may nominate experienced personnel in their work center to be screened and examined by the Quality Assurance Officer prior to their designation by the Commanding Officer as a Collateral Duty Inspector. In no case shall an Aircrew Survival Equipmentman perform his own quality assurance inspection. Procedures for quality assurance are listed following major operations.

NOTE

A functional test and pull cable proof load test shall be performed prior to placing in service or during aircraft Acceptance Inspection, and each fourth inspection cycle thereafter. A leakage test shall be performed at each inspection cycle. If inspection indicates damage beyond capability of maintenance, complete applicable forms and forward entire assembly to supply. Refer to paragraph 4-46 for determination of repairability.

4-18A. PLACE-IN-SERVICE INSPECTION. The Place-In-Service Inspection consists of the following steps:

1. Container/case inspection.
2. Functional test.
3. Pull cable proof load test.
4. Functional test and adjustment of manifold (if applicable).
5. Deflation.
6. Visual.
7. Liferaft configuration.
8. General inspection.
9. Markings inspection.
10. Survival items and accessories inspection.
11. Inflation assembly inspection (charged and discharged).
12. Cylinder markings inspection.
13. Leakage test.
14. Records initiation and validation of serial numbers.
15. Packing/rigging.

4-19. DAILY/PREFLIGHT/SPECIAL INSPECTION. To perform a Daily/Preflight/Special Inspection, visually inspect for the following:

CAUTION

Do not open liferaft access doors, RSSK kits or any sealed or safety-wired/safety tied portion of liferaft for this inspection.

1. Fabric for cuts, tears, deterioration and abrasion.

2. Seams for proper adhesion or stitching.

3. Straps and handles for security and wear.

4. Any other parts for wear, damage and security.

5. All hardware for security of attachment, corrosion, damage, wear, and if applicable, ease of operation.

6. Liferaft retaining line for proper stowage.

7. Liferaft painter line for presence and attachment.

8. Heaving line for proper stowage (if applicable).

9. That liferaft is properly stowed. Check for bulges caused by trapped air in liferaft.

10. Ripcord pins and cable for bends, fraying, or other damage; ripcord pins for security of attachment to cable.

11. Swaged ball on handle and swaging sleeve on cable for security.

WARNING

Use only authorized safety tie. No tape, wire, or cord shall be employed to secure ripcord pins.

12. Ripcord pins fully inserted into cones, and first and last (HSSP: first and third) ripcord pins safety-tied to cones with one turn size E nylon thread (V-T-295), single.

13. Snap fasteners on end flaps and ripcord protector flap (HSSP: slide fastener on ripcord protector flap) securely fastened.

14. If discrepancies are found or suspected, Maintenance Control shall be notified.

4-20. ACCEPTANCE/ISIS/PHASE INSPECTION. The Acceptance/ISIS/Phase Inspection consists of the following major tasks (to be performed in the order listed):

1. Container/Case Inspection

2. Functional Test (If Required)

3. Pull Cable Proof Load Test (If Required)

4. Functional Test and Adjustment of Manifold

5. Deflation

6. Visual

7. Liferaft Configuration

8. General Inspection

9. Markings Inspection

10. Survival Items and Accessories Inspection

11. Inflation Assembly Inspection

12. Inspection of Inflation Assembly (Charged)

13. Inspection of Inflation Assembly (Discharged)

14. Cylinder Markings

15. Leakage

16. Records Updating

17. Repacking

4-21. CONTAINER/CASE INSPECTION. To inspect packed containers/cases, examine the following:

1. Fabric for cuts, tears, deterioration, and abrasion.

2. Seams for proper adhesion of stitching.

3. Straps and handles for security and wear.

4. Any other parts for wear, damage, and security.

5. All hardware for security of attachment, corrosion, damage, wear and, if applicable, ease of operation.

6. Container and/or case for stains, dirt, and general condition.

4-22. FUNCTIONAL TEST. To functionally test a liferaft, proceed as follows:

CAUTION

Ensure that there is adequate area free of foreign objects for liferaft inflation.

1. Open liferaft carrying case and unfold liferaft.

2. Actuate inflation assembly.

3. Measure time of inflation; liferaft shall inflate to design shape without evidence of restriction in less than 1 minute.

4. Examine liferaft for obvious damage such as cuts, tears, ruptured seams, and damaged inlet valve.

5. Determine cause if liferaft does not properly inflate. Remove CO_2 bottle and inflation assembly, inspect for cleanliness. Inspect inlet valve on liferaft for imbedded foreign matter.

6. If correction is made, repeat steps 2 through 5.

7. Deflate liferaft in accordance with paragraph 4-24. Ensure that all carbon dioxide has been removed.

4-23. PULL CABLE PROOF LOAD TEST. To perform the proof load test, proceed as follows:

NOTE

Perform the Proof Load Test only after the functional test and prior to placing an inflation assembly in service.

1. Remove inflation valve plastic valve sleeve.

2. Remove pull cable from valve and apply a 50-pound pull force between cable ball and pull toggle.

3. Examine pull cable for broken strands of wire, deformed pull toggle and loose or cracked swage fittings. If any damage is found, the pull cable shall be discarded and replaced with a new cable. The new cable shall also be tested in accordance with step 2. If pull toggle is loose, it may be repaired or replaced at the discretion of the inspection activity.

4. If pull cable passes this test, reinstall in accordance with paragraph 4-42.

4-24. DEFLATION. To deflate liferaft, proceed as follows:

Support Equipment Required

Quantity	Description	Reference Number
1	Pump, Vacuum Unit	61E44688 (CAGE 80049)
As Required	Hose, Rubber, 3/8 or 1/2 inch Inside Diameter	—

1. Attach one end of rubber hose to vacuum pump.

2. Deflate through oral inflation valve. Unlock oral inflation valve, hold in open position, and hold vacuum pump hose against end of inflation valve. When compartment is collapsed, release oral inflation valve and screw lock closed.

4-25. VISUAL INSPECTION. To visually inspect the liferaft, proceed as follows:

CAUTION

Remove CO_2 cylinder prior to inflating liferaft with air.

1. Remove CO_2 cylinder from CO_2 cylinder sling.

2. Install diffuser plug in LR-1 CO_2 cylinder inflation valve.

NOTE

If a suitable air source is not available, water pumped nitrogen (FED SPEC BB-N-411) may be substituted.

Prior to visually inspecting a liferaft assembly, the liferaft (and inflatable floors, if applicable) shall be inflated with air to 1.0 psig.

3. Inflate liferaft with air to 1.0 psig.

4-26. LIFERAFT CONFIGURATION. The liferaft shall be updated by comparing it to figures 4-1 and 4-2.

4-27. GENERAL INSPECTION. To perform the general inspection, inspect the following:

NOTE

If color, location, or stitching patterns of repaired, replaced, or previously incorporated noncritical items or features (eg, liferaft pockets, handle, ballast bag, sea anchor, etc.) do not exactly conform to instructions, do not remove or rework item or feature if flotation stability or capability and security of attachment are not compromised.

1. Liferaft fabric for cuts, tears, punctures, deterioration and abrasion.

2. Seam tapes for proper adhesion.

3. Seam tapes joining tubes to floors, other tubes or canopy for adhesion and wear.

4. Liferaft floor and canopy for cuts, tears, punctures, and abrasions.

5. All patches for proper adhesion.

6. Pockets for tears, abrasions, and security of attachment.

7. Handles for wear, deterioration, and security of attachment.

8. Sea anchor for wear, tears, and security of attachment.

9. Presence and condition of securing line.

10. Oral inflation tube for deterioration.

11. All hardware for security of attachment, corrosion, damage, wear, and, if applicable, ease of operation.

12. Liferaft for stains, dirt, and general cleanliness.

13. Any other parts for wear and damage.

4-28. MARKINGS INSPECTION. Compare markings on liferaft and case and/or container to markings shown in tables 4-4 and 4-5. Restore faded markings. Correct any markings which do not agree with the applicable table. To change markings, proceed as follows:

Table 4-4. LR-1 Liferaft Markings

Markings	Location	Letter Height
LIFERAFT, INFLATABLE, ONE-MAN TYPE LR-1 MIL-L-81542A(AS) CONTRACT NO. [applicable number] MANUFACTURER DATE OF MANUFACTURE [month and year] SERIAL NO. [applicable number]	Port side, on outboard side of tube adjacent to sea anchor mooring patch	1/2 inch Yellow (See Note)
TO INCREASE PRESSURE, UNSCREW KNURLED RING, PUSH VALVE MOUTHPIECE DOWN AND IMMEDIATELY BLOW THROUGH INLET	Inboard side of tube adjacent to oral inflation valve pocket	3/16 inch Yellow (See Note)
RETAINING LINE	Retaining Line Pocket	1/4 inch Yellow
SEA ANCHOR MIL-A-3339B Type I Size 1 MANUFACTURER CONT. NO. [applicable number] DATE OF MANUFACTURE [month and year]	Inside of sea anchor	1/4 inch Red when sea anchor is blue. Blue when sea anchor is natural (white)
THIS LIFERAFT SHALL NOT BE USED UNTIL SUBJECTED TO THE CALENDAR INSPECTION REQUIREMENTS OF NAVAIR 13-1-6.1-1 AVIATION-CREW SYSTEMS MANUAL	Warning tag tied to boarding handle nearest inflation valve	
Note: Replacement markings shall be stamped or stenciled using waterproof black ink. Rafts that have been colored in service do not require marking on retaining line pocket.		

Table 4-5. LR-1 Case and Container Markings

Case/Container	Marking	Location	Letter Height
Standard Soft Pack Outer Container	STANDARD SOFTPACK OUTER CONTAINER	Main panel on either side of adjustable strap	7/8 inch
High Speed Soft Pack Outer Container	[None]		
Helicopter Liferaft (LR-1) Carrying Case	HELICOPTER LIFERAFT CONTAINER	Main panel	3/4 inch
	PULL YELLOW 6 FT LANYARD TO INFLATE CLIP SNAPHOOK TO SELF	Main panel	1 inch
Special Outer Container	[None]		
Combination Carrying Case and Equipment Container	EQUIPMENT	Upper side of equipment compartment	1 inch
	LIFERAFT	Cover Flap of raft compartment	1 inch
Equipment Container	EQUIPMENT RSSK OR HSSP	Main panel	1 inch 1/2 inch
Liferaft Cover	[None]		
Note: Replacement markings shall be stamped or stenciled using waterproof black ink.			

Materials Required

Quantity	Description	Reference Number
As Required	Ink, Marking, Laundry, Black	SPE-92 (NIIN 00-161-4229)
	-or-	
	Ink, Drawing, Waterproof, Yellow	A-A-59291 (NIIN 00-634-6583)

1. Paint over incorrect marking using waterproof ink (yellow or black as applicable).

2. Add correct marking as close as possible to specified location using waterproof ink.

4-29. SURVIVAL ITEMS AND ACCESSORIES INSPECTION. To inspect survival items and accessories, proceed as follows:

1. Inventory all accessories and survival items by checking items against table 4-1. Replace missing or unsatisfactory items.

NOTE

Ensure AN/URT-33A battery service life does not expire prior to the next scheduled calendar inspection. Refer to NAVAIR 16-30URT33-1 for battery service life. Batteries which exceed service life requirements must be discarded regardless of their condition.

2. Inspect all items for damage, spent contents, and expired service life. Replace as necessary.

NOTE

NAVAIR 13-1-6.5 contains information inspection/replacement and modification of the survival items.

3. Operate all items which are not expended in use. Replace as necessary.

4-30. INFLATION ASSEMBLY INSPECTION. Inspect the inflation assembly as required.

4-31. Inspection of Inflation Assembly (Charged). To inspect a charged inflation assembly, proceed as follows:

WARNING

Gas under pressure. Do not attempt to remove cylinder from valve.

Ensure that diffuser plugs (P/N 1614703-1 (CAGE 99251, NIIN 01-077-1734)) are installed in all LR-1 CO_2 cylinders.

1. Inspect cylinder markings. Re-mark as required in accordance with paragraph 4-33.

WARNING

Damage to the slot that the sliplock is seated in may allow plastic cap and sleeve to unseat. If the sliplock is not seated properly on inflation valves which do not have spring clips installed, it may result in a malfunction of the liferaft inflation process.

1A. On inflation valves which do not have spring clips installed, verify the spring sliplock in the plastic cap and sleeve is properly seated in the slot on the inflation valve. Have technician loosen setscrew and gently move cap in an up and down motion to verify the sliplock is seated. Have technician align setscrew with the vertical groove on the inflation valve and retighten.

2. Examine inflation assembly for evidence of corrosion, wear, loose screws, and dents. If damage or extensive wear is found, replace valve, cylinder, housing, or pull cable. If pull cable is replaced perform pull cable proof load test in accordance with paragraph 4-23.

WARNING

Excessive glue around the FLU-6/P valve cap/sleeve may result in a malfunction of the liferaft inflation process. Remove excessive glue, then continue inspection.

3. Examine pull cable for broken strands and loose or defective swage joints. Inspect plastic parts for cracks and breaks. Ensure that valve cap is cemented to plastic valve sleeve, and plastic valve sleeve is permanently attached to metal valve sleeve. Use polychloroprene adhesive (NIIN 00-515-2246) only.

NOTE

To obtain the correct gross weight of the CO_2 cylinder, subtract weight of the diffuser plug from total weight indicated on scale.

4. Weigh inflation assembly. If weight indicated on scale is not the same as the gross weight printed on the cylinder (with tolerance specified), or if no gross weight is printed on the cylinder, discharge the cylinder and recharge it to 0.49 to 0.51 lbs. of CO_2 in accordance with paragraph 4-42.

4-32. Inspection of Inflation Assembly (Discharged). To inspect a discharged inflation assembly, proceed as follows:

1. Inspect cylinder markings. Re-mark as required in accordance with paragraph 4-33.

WARNING

Damage to the slot that the sliplock is seated in may allow plastic cap and sleeve to unseat. If the sliplock is not seated properly on inflation valves which do not have spring clips installed, it may result in a malfunction of the liferaft inflation process.

2. Examine inflation assembly for evidence of corrosion, wear, loose screws, dents and any distortion to the lip of the slot that sliplock is seated in. If damaged or extensive wear is found, replace valve, cylinder, housing, or pull cable. If pull cable is replaced, perform pull cable proof load test in accordance with paragraph 4-23.

3. (MIL-V-81722 Valve, FLU-6/P) Examine pull cable for broken strands and loose or defective swage joints. Inspect plastic parts for cracks and breaks. Ensure that valve cap is cemented to plastic valve sleeve, and plastic valve sleeve is permanently attached to metal valve sleeve. Use polychloroprene adhesive (NIIN 00-515-2246) only.

4. Recharge assembly in accordance with paragraph 4-42.

4-33. Cylinder Markings. Markings on all CO_2 inflation cylinders shall be in black letters 1/4-inch high. Information shall include gross weight, tare weight, and

weight of CO_2. Paint and stencil cylinder as required. The weight of CO_2 is 0.49 to 0.51 lbs. Ensure that all markings are included as necessary.

4-34. LEAK TEST. To perform a leak test, proceed as follows:

4-35. Test Procedure. Use test fixture described in Chapter 3 to test liferaft for leakage as follows:

CAUTION

Ensure that area surrounding liferaft is clear of foreign objects. Liferaft should not be disturbed during leakage test.

If three-way valve is not used, measuring device valve must be closed when air-feed valves are open.

On LR-1 liferaft, damage may occur to oral inflation valve if air supply pressure entering the liferaft exceeds ten (10) psi during this test.

NOTE

If a suitable air source is not available, water-pumped nitrogen (BB-N-411) may be substituted.

1. Unlock oral inflation valve and insert into 1/2-inch diameter rubber hose. Open valve to air supply and inflate liferaft. Alternately position valve at measuring device, vent and air supply until proper pressure of 2.0 psig is attained.

2. The air supply shall be securely shut off and after a minimum of 15 minutes, the pressure shall be readjusted, if necessary, to the leakage test pressure.

3. Disconnect air supply and check for leaks. Ensure that all valves are closed. Record time.

4. Record temperature and barometric pressure and allow raft to remain undisturbed for a minimum of 4 hours.

NOTE

If the raft has been stacked during the 4-hour inspection period remove from stacking and place in a horizontal position on the floor or table in the inspection area and take test pressure reading. In no event shall the pressure in the raft be determined with another raft stacked upon it.

5. After a minimum of 4 hours after completing step 3, record the test pressure. Test pressure shall not decrease to less than 1.6 psig from a maximum test pressure of 2.0 psig.

NOTE

Steps 6 through 15 shall be performed only after leakage test readings have been recorded.

6. Record temperature and barometric pressure and correct test pressure for any changes in temperature and barometric pressure. Refer to tables 4-6 and 4-7.

EXAMPLE

UNCORRECTED TEST READING 1.70 PSI

	TEMP.	BARO.
START	75° F	29.90 IN. Hg
END	70° F	29.70 IN. Hg
DIFFERENCE	- 5° F	-0.20
CORRECTION	+0.155	-0.098

TEMP. CORRECTION	+ 0.155
+ BARO. CORRECTION	- 0.098
CORRECTION	+ 0.057

UNCORRECTED READING	1.700 PSI
+ CORRECTION	+ 0.057
CORRECTED READING	1.757 PSI

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Step 6 - Para 4-35

Table 4-6. Temperature Conversion Chart

Temperature Difference (Degree F.)	Correction (psi)
1	0.031
2	0.062
3	0.093
4	0.124
5	0.155
6	0.186
7	0.217
8	0.248
9	0.279
10	0.310
Rise in temperature: subtract from gage reading. Fall in temperature: add to gage reading.	

Table 4-7. Barometric Pressure Conversion Chart

Press. Diff. (inHG)	Corr. (psi)	Press. Diff. (inHG)	Corr. (psi)	Press. Diff. (inHG)	Corr. (psi)	Press. Diff. (inHG)	Corr. (psi)	Press. Diff. (inHG)	Corr. (psi)
0.01	0.005	0.16	0.078	0.31	0.152	0.46	0.225	0.61	0.299
0.02	0.010	0.17	0.083	0.32	0.157	0.47	0.230	0.62	0.304
0.03	0.015	0.18	0.088	0.33	0.162	0.48	0.235	0.63	0.309
0.04	0.020	0.19	0.093	0.34	0.167	0.49	0.240	0.64	0.314
0.05	0.025	0.20	0.098	0.35	0.172	0.50	0.245	0.65	0.319
0.06	0.030	0.21	0.103	0.36	0.176	0.51	0.250	0.66	0.323
0.07	0.035	0.22	0.108	0.37	0.181	0.52	0.254	0.67	0.328
0.08	0.040	0.23	0.113	0.38	0.186	0.53	0.260	0.68	0.333
0.09	0.045	0.24	0.118	0.39	0.191	0.54	0.265	0.69	0.338
0.10	0.049	0.25	0.123	0.40	0.196	0.55	0.270	0.70	0.343
0.11	0.054	0.26	0.127	0.41	0.201	0.56	0.275	0.71	0.348
0.12	0.060	0.27	0.132	0.42	0.206	0.57	0.279	0.72	0.353
0.13	0.064	0.28	0.137	0.43	0.211	0.58	0.284	0.73	0.358
0.14	0.069	0.29	0.142	0.44	0.216	0.59	0.289	0.74	0.363
0.15	0.073	0.30	0.147	0.45	0.221	0.60	0.294	0.75	0.368

Rise in pressure: add to gage reading.
Fall in pressure: subtract from gage reading.

7. If pressure of compartment is below pressure limits of 1.6 psig, inflate to leakage test pressure of 2.0 psig and check for leaks, using a soap solution. Mark leaks, rinse with fresh water, and dry with a lint free cloth. Determine repairability in accordance with paragraph 4-46.

8. Check operation of inlet check valve by depressing stem. Air must escape. Release stem, and flow of air must stop. Apply soap solution to valve and check for leakage. Inspect valve for damage, excessive wear and corrosion.

9. Depress end of oral inflation valve and air must escape. Release valve and flow must stop. Inspect valve and tube for damage and excessive wear.

10. Deflate liferaft in accordance with paragraph 4-24.

11. Attach retaining line to neck of cylinder with a lark's head knot.

12. Install antichafe disc.

13. (LR-1 with MIL-V-81722, FLU-6/P Inflation Valve.) Pass loop end of webbing retaining line around inflation valve at cylinder neck. Pass end of line with snaphook through loop and pull line tight, forming a lark's head knot. Tack lark's head knot with two turns of waxed, nylon 6-cord, single. Tie ends with surgeon's knot followed by square knot.

14. Reinstall properly charged inflation assembly.

15. Tighten coupling nut to liferaft inlet valve to a torque value of 80 to 90 in-lb.

4-36. RECORDS UPDATING. Make necessary entries on appropriate form in accordance with OPNAVINST 4790.2 Series.

4-37. CLEANING AND SERVICING.

4-38. Cleaning and servicing consists of cleaning the liferaft and containers and/or cases, replacing the safety disc and washer on inflation valves, and recharging CO_2 cylinders.

4-39. CLEANING OF LIFERAFTS. To clean liferafts, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Detergent, General Purpose	MIL-D-16791 NIIN 00-282-9699
As Required	Cloth, Lint-Free, Type II	MIL-C-85043 NIIN 00-044-9281
As Required	Talc, Technical	MIL-T-50036A NIIN 01-080-9589

CAUTION

Solvents are not to be used in the cleaning of liferafts.

1. Prepare solution of detergent (MIL-D-16791) consisting of 1/4 to 1/2 ounce of detergent per gallon of water.

2. Apply cleaning solution to soiled area with a spray or sponge.

3. Allow solution to remain on the surface for several minutes, then agitate with a soft brush or rag.

4. Rinse surface thoroughly with water; wipe with a cloth or sponge. Repeat this application until surface is free from all solution.

5. Dry liferaft with a lint-free cloth and apply a light coating of talc.

4-40. CLEANING OF CONTAINERS AND/OR CASES. Clean in accordance with paragraph 4-39.

4-41. REPLACEMENT OF SAFETY DISC AND WASHER ON INFLATION VALVES. (See figure 4-7.) To replace safety disc and washer on inflation valve assembly proceed as follows:

WARNING

Before performing any work on inflation valves, ensure that CO_2 inflation assemblies are completely discharged. Do not remove valve or valve safety disc plug from a charged CO_2 assembly.

Materials Required

Quantity	Description	Reference Number
1	Repair Kit (Insert, Washer, Disc)	903684 (CAGE 33525) NIIN 00-703-7811
1	Wrench, Torque	—
1	Socket, 5/16 inch	—
1	Hex Stock, 5/16 x 2 inch Length	—

1. Remove cylinder from liferaft.

2. Remove safety disc plug; insert safety disc and washer.

3. Place new washer into inflation valve safety disc orifice.

4. Place new safety disc into inflation valve safety disc orifice:

5. Replace insert and safety disc plug.

NOTE

While tightening the safety disc plug, align insert with plug.

6. Tighten safety plug to 15 to 17 ft-lb torque.

4-42. RECHARGING. To recharge the inflation assembly, proceed as follows (see figure 4-8):

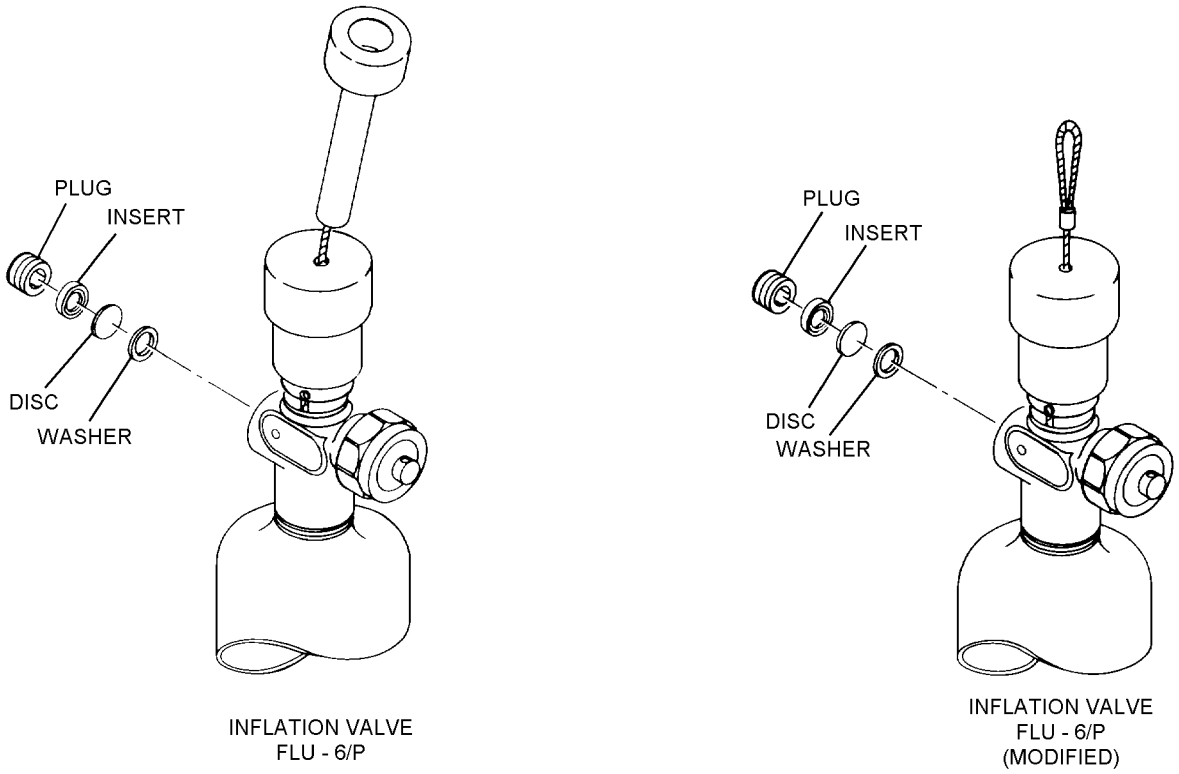

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Figure 4-7. Disassembly of Inflation Valve Safety Disc Assembly

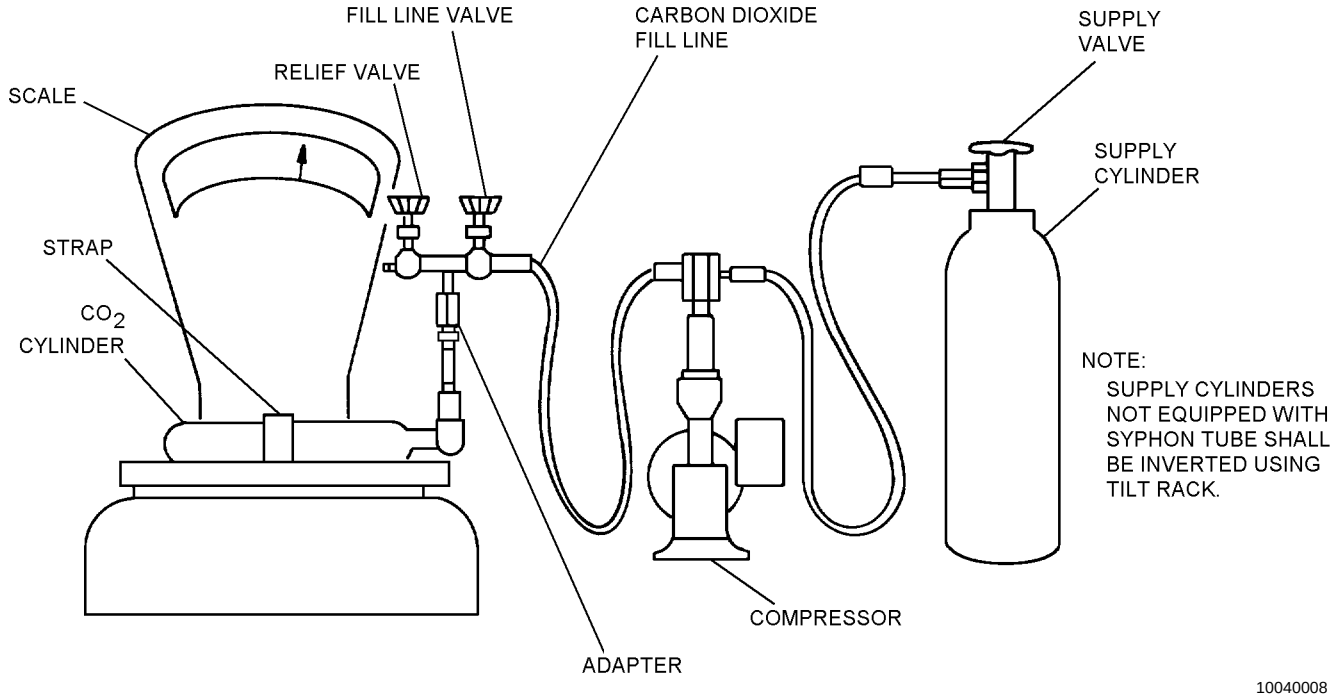

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Figure 4-8. Recharging Schematic

WARNING

When discharging partially charged or overcharged CO_2 cylinders, hold firmly in place with a suitable holding device (vice). Protect CO_2 cylinder from vice jaws with cloth or a suitable substitute. Position cylinders so escaping gas is not directed toward any personnel.

NOTE

Charged inflation assemblies used as spare replacements shall be inspected in accordance with paragraph 4-32 prior to raft installation.

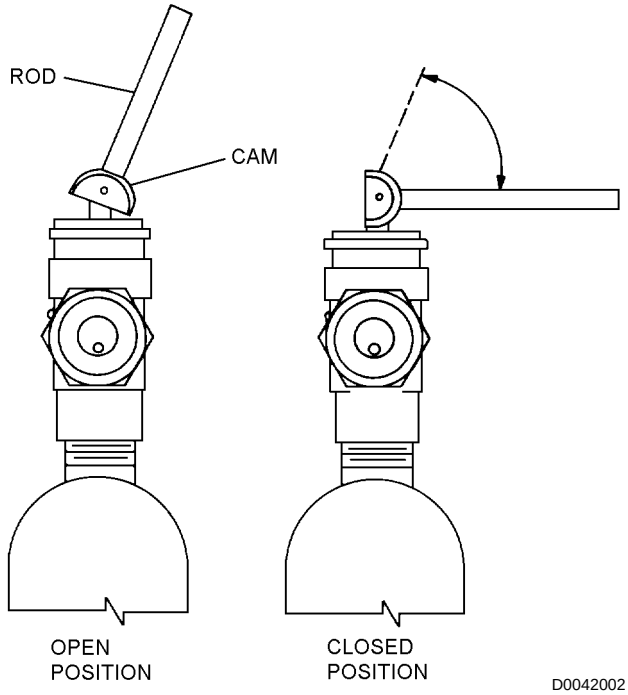
To perform the following filling procedures it is necessary to ensure that CO_2 cylinder is completely discharged.

1. (Inflation Valve FLU-6/P) Remove setscrew. Using small paper clip, raise spring slip-lock in slot on plastic sleeve. Remove plastic sleeve.

NOTE

To facilitate sleeve removal, insert 0.260 to 0.265-inch diameter rod through hole in cap and into hole in cam.

2. Rotate cam 2 or 3 times to ensure proper operation. Remove diffuser plug, if installed.



Step 2 - Para 4-42

3. Weigh and record tare weight (empty weight cylinder, valve and cable assembly) of inflation assembly. Correct tare weight marking on cylinder if necessary.

NOTE

Supply cylinders not equipped with siphon tube must be inverted during transfer operation. Inverting cylinder allows the liquid to flow from the valve. Supply cylinders with siphon tube (straight pipe) extending from the valve to the bottom of the cylinder can be emptied in the vertical position.

4. Install proper charging adapter on inflation assembly.

5. Secure inflation assembly to weighing pan.

6. Open supply cylinder valve, fill line valve and relief valve to purge fill line. Close fill line valve and relief valve.

NOTE

Ensure fill line is free from contact with any object along entire distance from compressor to charging adapter. If fill line does not hang free, accurate weight readings cannot be obtained.

7. Connect fill line to inflation assembly and zero scale.

NOTE

Proper charge weight of CO_2 is 0.49 to 0.51 lbs for cylinder types MS26545B2C0020, MS26545B4C0020 or MS26545B4C0021.

8. Ensure inflation assembly valve is open.

9. Open fill line valve.

10. Allow carbon dioxide to cascade from supply cylinder into inflation assembly. If gross weight (tare weight plus weight of charge is 0.49 to 0.51 lbs) cannot be reached, start compressor and complete charging. Stop compressor upon reaching proper gross weight.

11. Close fill line valve.

12. Close inflation assembly valve. Open relief valve on fill line valve if applicable.

13. Disconnect fill line from inflation assembly. Remove charging adapter.

14. Measure gross weight of charged inflation assembly.

15. If gross weight of inflation assembly is greater than required, carefully bleed off excess from inflation assembly. If gross weight is less than required, reinstall charging adapter and repeat steps 6 through 15.

16. Reinstall diffuser plug, if applicable.

NOTE

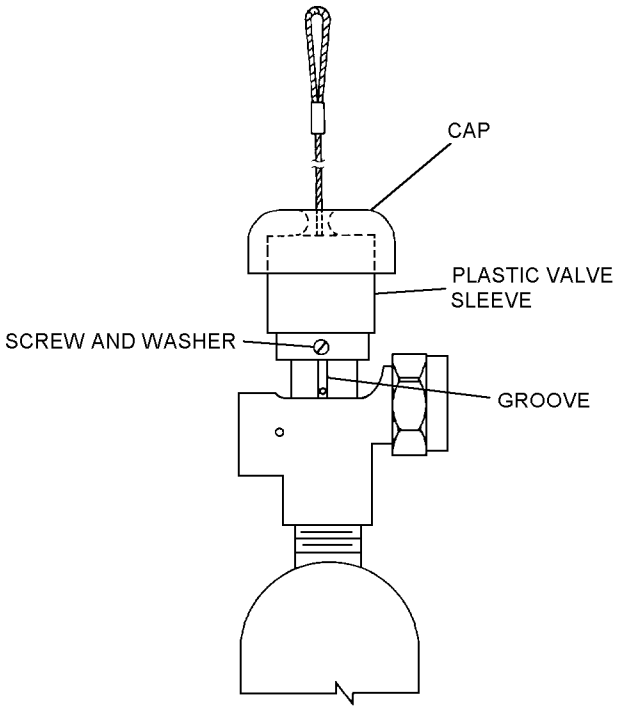
When other cylinders are to be recharged immediately, leave supply cylinder valve open.

17. Close supply and bleed system pressure.

WARNING

If spring sliplock is not properly seated in the slot on inflation valves which do not have spring clips installed, it may result in a malfunction of the inflation process.

18. Place ball end of cable through sleeve and into hole in cam. Align screw hole in sleeve with groove on valve and slide sleeve over cam and onto valve. Using a paper clip, raise spring sliplock in slot on sleeve and ensure sleeve is fully seated and raised. Install screw and washer. On inflation valves which do not have spring clips installed, verify the spring sliplock in the plastic cap and sleeve is properly seated in the slot on the inflation valve. Have technician loosen setscrew and gently move cap in an up and down motion to verify the sliplock is seated. Have technician align setscrew with the vertical groove on the inflation valve and retighten.



Step 18 - Para 4-42

NOTE

Ensure valve cap is cemented to plastic sleeve. Use polychloroprene adhesive (NIIN 00-142-9913) only.

Valves received from supply without spring clip are to be considered RFI. Spring clip is no longer required.

The LR-1 inflation valve FLU-6/P can be cocked on either of the two opposite flats on the cam head. When cocked on one of the flats after recharging, leakage may be possible because of a slightly asymmetrical cam head. After recharging the cylinder, submerge assembly in water, observe for bubbles from valve, then dry and store for 24 hours. After storage period check for proper weight. If no leakage, return assembly to service after ensuring valve cam is fully seated on flat. If leakage has occurred, recharge, recock on opposite flat and perform the above test for leakage. If no leakage, return assembly to service. If leakage has occurred again, return valve to supply.

19. Immerse inflation assembly in water tank.

20. Check for leaks; then remove assembly from tank and dry with an air blast. Wipe assembly with a lint-free cloth.

NOTE

After storage period, inflation assembly should be checked for proper weight.

21. If required, re-mark tare weight, gross weight, charge weight on cylinder.

22. If inflation assembly is not to be installed, attach a red tag with the following instructions printed in ink: WARNING: WEIGH INFLATION ASSEMBLY BEFORE INSTALLING ON LIFERAFT. DO NOT INSTALL IMPROPERLY CHARGED CYLINDER.

4-43. REPAIR/REPLACEMENT.

4-44. This section contains instructions for the repair, replacement, modification or fabrication of various components or subassemblies of liferafts to ensure that appropriate items of equipment remain in Ready For Issue (RFI) status. Reference numbers for parts which are defective, corroded or worn and require replacement are included in the applicable paragraph of this section. Other replacement parts, such as carrying cases and personal survival equipment, are listed in the applicable table. All repairs shall be documented by making necessary entries on appropriate form in accordance with OPNAVINST 4790.2 Series.

4-45. Replacement of easily removed assembly components such as CO_2 inflation valves and survival items are authorized in addition to repair and replacement procedures documented in this section. The liferaft shall be subjected to a functional test and leakage test each time CO_2 inflation valves are removed and replaced for any reason, and each time inflation valve gaskets are replaced.

4-46. DETERMINATION OF REPAIRABILITY. Liferafts shall be considered beyond repair for any of the following reasons:

1. Porous fabric areas on tubes.

2. Split or open tube seams.

3. Leakage test failure resulting from other than cut, tear, or puncture.

4. Damaged, malfunctioning, excessively worn, or corroded inlet valve, manifold assembly or oral inflation tube, as applicable.

5. Extensively damaged floor.

6. Holes or abrasions exceeding 2 inches in length or diameter in pneumatic compartment.

7. Oral inflation or inlet valve stem separating from the fabric on the LR-1 liferaft.

8. Deterioration of the rubberized fabric caused by oil, grease, or any other foreign substance.

9. Deterioration of the rubberized fabric caused by a heavy mildewed condition.

10. Rips, tears, or punctures in the pneumatic compartments which exceed 2 inches.

11. In the judgement of a competent inspector, requiring excessive repair.

4-47. CEMENTING LIFERAFTS. All cementing of liferafts shall be performed as follows:

Support Equipment Required

Quantity	Description	Reference Number
1	Roller, Wooden	GGG-R-00620 NIIN 00-243-9401

Materials Required

Quantity	Description	Reference Number
1	Brush, Disposable	A-A-289/H-B-643 NIIN 00-514-2417
As Required	Toluene	TT-T-548 NIIN 00-281-2002
	-or-	
	Methyl Ethyl Ketone, (MEK)	TT-M-261 NIIN 00-281-2762
As Required	Adhesive, Class 3, Polychloroprene	MIL-A-5540 NIIN 00-142-9913
As Required	Talc, Technical	MIL-T-50036A NIIN 01-080-9589

WARNING

Do not use toluene or MEK near open flames, heat or electrical sparks. Avoid prolonged contact with skin or breathing of fumes. Use only in well-ventilated area.

NOTE

Toluene shall be the primary solvent used in the fabrication or repair of this assembly. MEK may be used if Toluene is not available. Always use solvents sparingly and wipe up excess solvents; do not allow to dry by evaporation.

Toluene or MEK must be applied vigorously to liferaft material over three years old in order to reactivate the material prior to cementing. Pigment from the material coloring staining a cloth rubbed over the treated surface will indicate the material has been reactivated. Adhesive shall be applied immediately after the surface has dried.

1. Clean both surfaces to be cemented together with four applications of toluene or MEK. Apply toluene or MEK with back-and-forth strokes on the first and third applications, and one-way strokes on the second and fourth applications. Allow areas to dry between applications.

CAUTION

Use only Polychloroprene adhesives and Polycloroprene-coated cloth and patches on Polychloroprene-coated LR-1 liferaft assemblies.

2. Prepare cement and accelerator mixture. Prepare only enough mixture for 8 hours, as this is the effective active period for the mixture. Dispose of any remaining mixture at this time.

3. Using a disposable brush, apply adhesive to completely cover surfaces to be cemented together. Use long one-directional strokes and complete each surface before adhesive becomes tacky as the brush may pull tacky adhesive from the surface. Allow to dry for ten minutes.

4. Apply a second coat of adhesive as in step 3. Use brush strokes perpendicular to the original direction.

5. When second coat of adhesive has become tacky, place pieces together. If cemented area is a cut or tear, butt edges of damage before applying patch. Roll out bubbles with a wooden roller.

6. Allow adhesive to cure a minimum of 48 hours.

7. Dust area with talc.

4-48. PATCHING LIFERAFTS. To patch liferaft select color patch to approximately match and proceed as follows:

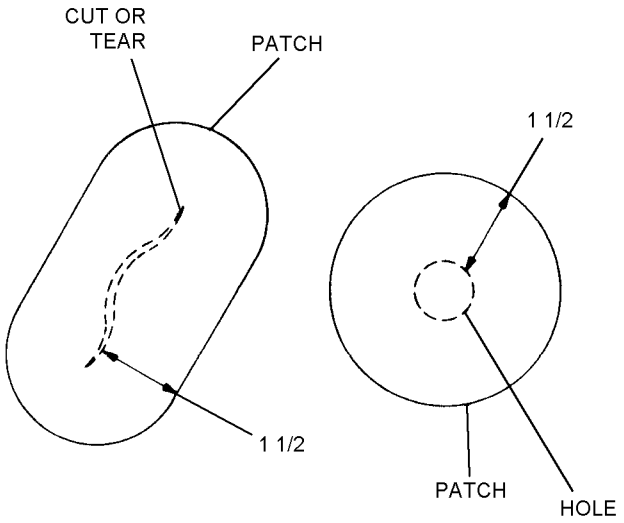
Materials Required

Quantity	Description	Reference Number
As Required	Cloth, Nylon, Coated, Var. D, Blue	MIL-C-23070 NIIN 00-132-5009

CAUTION

Use only Polychloroprene adhesives and Polycloroprene-coated cloth and patches on Polychloroprene-coated LR-1 liferaft assemblies.

1. Cut a rounded patch 1 1/2 inches larger than the damage on all sides.



Step 1 - Para 4-48

2. Scallop edges of patch if it is larger than 5 inches in diameter.

3. If damaged area in floor is larger than 1 inch, patches shall be applied to both sides.

4. Center patch over damage and trace on outline of patch on fabric.

5. Cement patch to damaged area in accordance with paragraph 4-47.

6. Dust area with talc.

7. Perform a leakage test.

4-49. RECEMENTING OR REPLACING SEAM TAPES. This repair shall be performed only if a flotation tube does not leak, that is, if only the outer seam tape is loose, or if the seam does not seal a flotation tube. To recement or replace a seam tape, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Toluene	TT-T-548 NIIN 00-281-2002
	-or-	
	Methyl Ethyl Ketone (MEK)	TT-M-261 NIIN 00-281-2762
As Required	Talc, Technical	MIL-T-50036A NIIN 01-080-9589

NOTE

Seam separation in floors and seats may be repaired provided safety and flotation capabilities are not compromised. Exercise sound judgement in determining whether such repairs are within local capabilities. All cementing shall be performed in accordance with paragraph 4-47.

1. If tape is present and undamaged, recement tape to liferaft.

2. If tape is missing, measure and fit a replacement tape to area and cement in place. Overlap other seams a minimum of 1 inch.

WARNING

Do not use toluene or MEK near open flame, heat, or electrical sparks. Avoid prolonged contact with skin or breathing of fumes. Use only in well-ventilated area.

CAUTION

Avoid excessive application of toluene or MEK on seams. Remove any spilled or excessive toluene or MEK immediately.

NOTE

Toluene shall be the primary solvent used in the fabrication or repair of this assembly. MEK may be used if toluene is not available. Always use solvents sparingly and wipe up excess solvents; do not allow to dry by evaporation.

3. If tape is damaged, peel damaged tape from liferaft. Apply toluene or MEK only as needed to loosen tape. Trim damaged tape and replace with new tape. Overlap other seam tape a minimum of 1 inch.

4. Perform leakage test (paragraph 4-34).

4-50. SEA ANCHOR/MOORING LINE REPLACEMENT. To replace worn or damaged sea anchor or mooring line, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Sea Anchor, Type I, Size 1	MIL-A-3339
As Required	Cord, Nylon Type III	MIL-C-5040 NIIN 00-240-2146

1. (Complete Assembly Replacement) Secure free end of mooring line to sea anchor mooring patch on liferaft with bowline knot followed by an overhand knot.

2. (Mooring Line Replacement Only) Sear both ends of a 16-foot length of MIL-C-5040 Type III nylon cord. Secure one end to sea anchor bridle, and other end to sea anchor mooring patch on liferaft with bowline knot followed by an overhand knot.

4-51. INSPECTION RECORD PATCH.

NOTE

The 28th In-Service Management Panel meeting for Aviation Life Support Systems rescinded the requirement for the packer to sign the Inspection Record Patch on liferafts. The requirement for all other record documentation remains unchanged. The reason for this change is that most Inspection Record Patches are unreadable, and the packer's and inspector's names, including the type of inspection (leak/functional), are documented on Aviation Crew Systems Records.

4-52. FABRICATION OF ANTI-CHAFING DISC. To fabricate the anti-chafing disc, proceed as follows:

Materials Required

Quantity	Description	Reference Number
6 x 12 inches	Cloth, Nylon, Coated, Var. D, Blue	MIL-C-23070 NIIN 00-132-5009

1. Cut two 6-inch diameter discs from nylon liferaft cloth and cut a 1-inch diameter hole in center of each disc.

NOTE

Cement applications shall be performed in accordance with paragraph 4-47.

2. Cement discs together and allow cement to dry.

4-53. FABRICATION OF RETAINING LINE. To fabricate the retaining line, proceed as follows (See figure 4-10):

Figure 4-9. Deleted

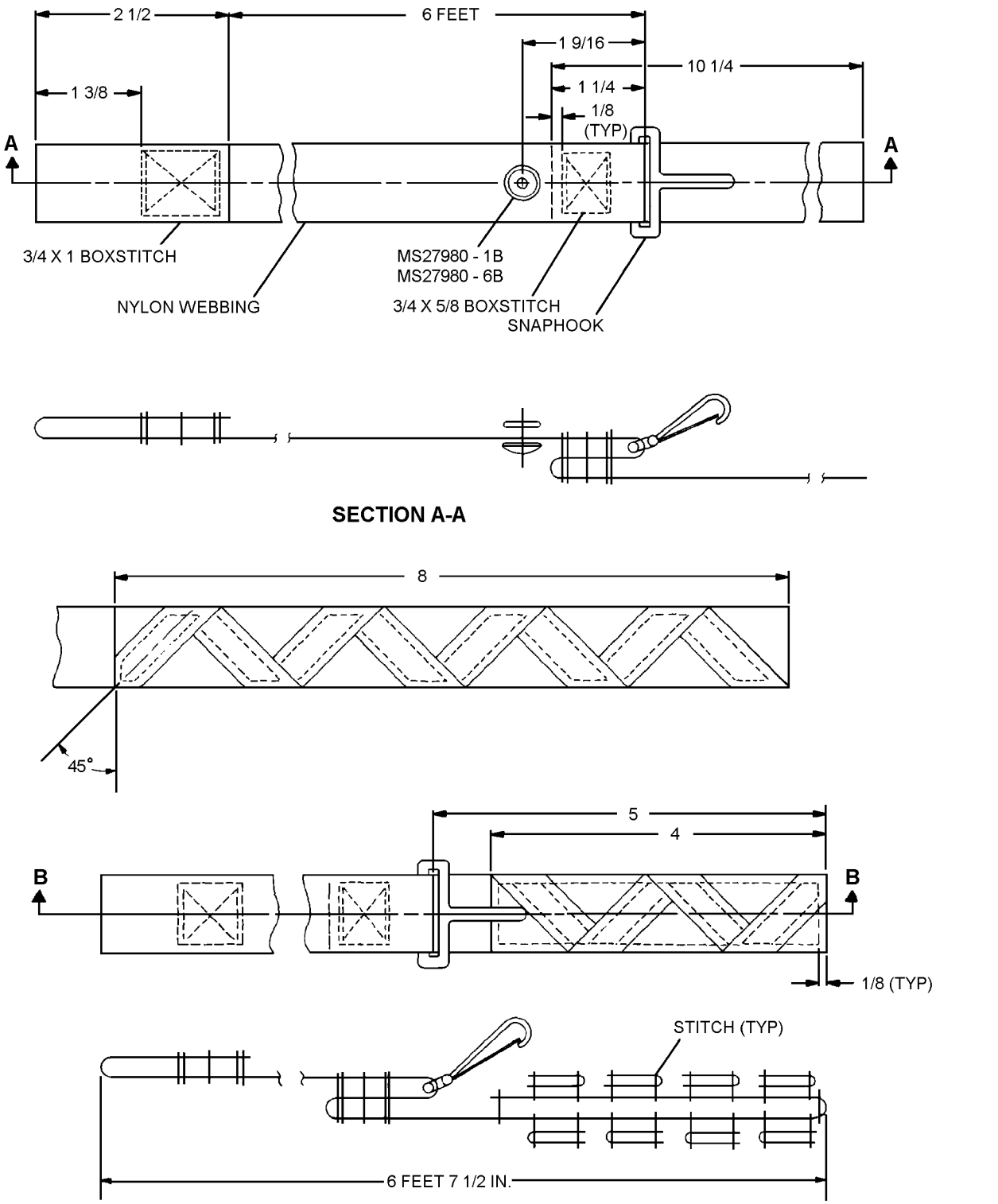


Figure 4-10. Webbing Retaining Line, Details

Support Equipment Required

Description	Reference Number
Chuck, Fastener	1410 (CAGE 83058)
Die, Fastener	1410 (CAGE 83058)
Chuck, Fastener	1412 (CAGE 83058)
Die, Fastener	1407 (CAGE 83058)
Press	M-100 (CAGE 83058)
Punch, 1/8-inch	

Materials Required

Quantity	Description	Reference Number
8 feet 4 1/2 inches	Webbing, Nylon, Type II, 1-inch, Yellow	MIL-W-4088
1	Cap, Snap Fastener	MS27980-1B
1	Socket, Snap Fastener	MS27980-6B
1	Stud, Snap Fastener	MS27980-7B
1	Eyelet, Snap Fastener	MS27980-8B
1	Snaphook	M43770/1-CWBC3
As Required	Thread, Nylon, Type II, Size E	V-T-295 NIIN 00-204-3884

1. Cut 12 inches of webbing from the 8-foot 4 1/2-inch length. Sear ends of both pieces.

2. Position snaphook 11 1/2 inches from one end of longer piece of webbing. Fold webbing to dimensions shown in figure 4-10, and stitch as shown using size E nylon thread (V-T-295, Type II), 8 to 10 stitches per inch. Backstitch minimum of 1/2 inch.

3. Install snap fastener.

4. Form a loop at other end of line by folding 2 1/2 inches from end of line. Boxstitch as shown.

5. Fold the 12-inch piece of webbing in half lengthwise, and sew to end of retaining line to provide reinforcement.

6. Fold reinforced webbing in half. Sew the 4-inch fold.

7. (For Use in High Speed Soft Pack). Install stud and eyelet (MS27980-7B, 8B) on upper flap of High Speed Soft Pack so that stud is on inside.

4-54. FABRICATION OF BOARDING HANDLE ASSEMBLY. To fabricate the boarding handle assembly, proceed as follows:

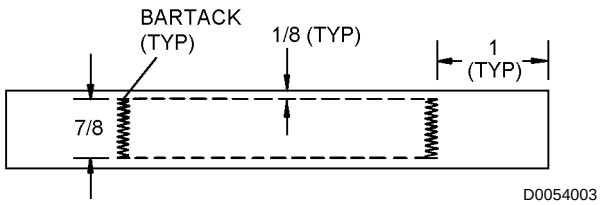
Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type II	MIL-W-4088
As Required	Cloth, Nylon, Coated, Blue, Var. D	MIL-C-23070 NIIN 00-132-5009
As Required	Thread, Nylon, Type II	V-T-295 NIIN 00-204-3884

1. Cut two 9-inch pieces of nylon webbing for handle.

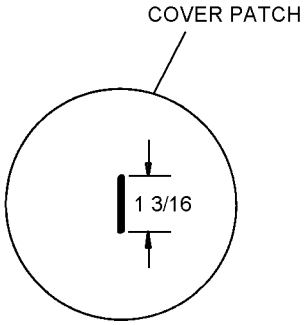
2. Cut two 3 1/2-inch diameter discs for cover patch and two 2 1/2-inch diameter discs for base patch from blue nylon raft cloth.

3. Stitch the two 9-inch lengths of webbing together, using size E nylon thread (V-T-295, Type II).



Step 3 - Para 4-54

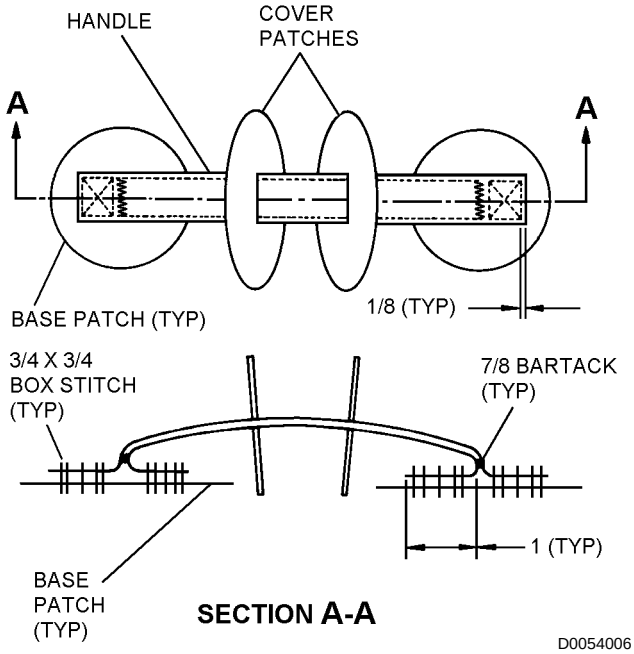
4. On centerline of the two 3 1/2-inch cover patches make a slit 1 3/16 inches in length.



Step 4 - Para 4-54

5. Insert handle through slit in each cover patch.

6. Separate ends of handle and stitch to each base patch.



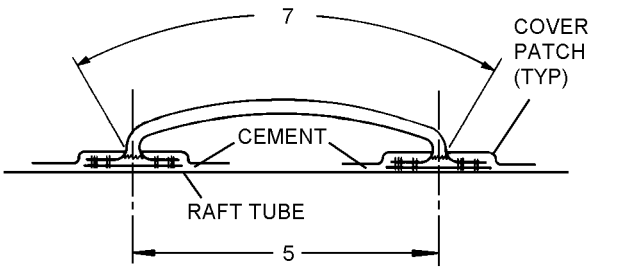
Step 6 - Para 4-54

NOTE

Cement applications shall be performed in accordance with paragraph 4-47.

7. Inflate raft through oral inflation valve to 1 psig.

8. Position handle so that center of loop handle falls slightly below horizontal centerline of the inflated tube. Slide cover patches to ends of handle. Ensure that a 7-inch arc is present to facilitate grasp. Cement patches to raft tube.



Step 8 - Para 4-54

4-55. REPLACEMENT OF SECURING LINE. To replace securing line, proceed as follows:

Materials Required

Quantity	Description	Reference Number
5 feet	Cord, Nylon, Type III	MIL-C-5040 NIIN 00-240-2146

NOTE

Securing line for the LR-1 liferaft is required in the standard soft pack, high-speed soft pack, and special soft pack.

1. Sear ends of 5-foot length of Type III nylon cord.

2. Insert one end of nylon cord through webbing loop on sea anchor mooring patch and secure with a bowline knot followed by an overhand knot.

3. (STANDARD AND SPECIAL SOFT PACKS) Ensure that free end is secured to raft container during packing with a bowline knot followed by an overhand knot.

4. (HIGH SPEED SOFT PACK) Ensure that free end is secured to the loop on the equipment container during packing with a bowline knot followed by an overhand knot.

5. Loop cord into 12-inch bights and secure with a rubber band.

4-56. REPLACEMENT OF MIL-V-25492 INFLATION VALVE WITH MIL-V-81722 (FLU-6/P) INFLATION VALVE (RSSK INSTALLATION ONLY). To replace the MIL-V-25492 inflation valve with the MIL-V-81722 inflation valve, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Inflation Valve	MIL-V-81722

1. Remove raft from Rigid Seat Survival Kit.

WARNING

Gas under pressure. Do not remove inflation valve from a charged cylinder.

2. Remove inflation assembly from raft, discharge inflation assembly, and remove MIL-V-25492 inflation valve from cylinder.

3. Remove and discard plastic dust cap on MIL-V-81722 inflation valve inlet. Do not discard copper gasket under dust cap.

4. Place copper gasket on cylinder neck, thread MIL-V-81722 inflation valve onto cylinder, and tighten to a torque of 65 to 70 ft-lb.

5. Recharge inflation assembly in accordance with paragraph 4-42.

4-57. INSTALLATION OF HOOK TAPE ON CYLINDER SLING (HELO BACK PACK). To install hook tape on cylinder sling, proceed as follows:

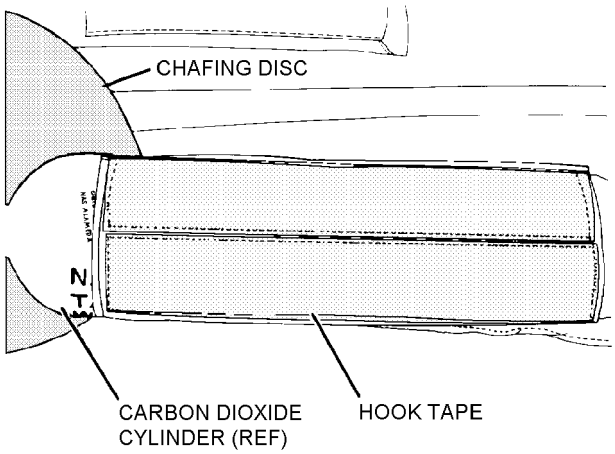
Materials Required

Quantity	Description	Reference Number
12 inches	Tape, Hook, Type II, Black, 1 inch	MIL-F-21840 NIIN 00-795-1087
2 1/4 x 6 1/2 inches	Cloth, Nylon, Coated	MIL-C-23070 NIIN 00-086-5829

1. Cut 12-inch length of hook tape into two 6-inch pieces.

2. Sew each 6-inch piece of hook tape to 2 1/4- by 6 1/2-inch piece of nylon raft cloth.

3. Cement patch to cylinder sling.



D0057003

Step 3 - Para 4-57

4-58. MODIFICATION OF THE LR-1 HELO BACK PACK CO_2 INFLATION SYSTEM. To modify Helo Back Pack CO_2 inflation system equipped with a MIL-V-81722 (FLU-6/P) inflation valve, proceed as follows:

Materials Required

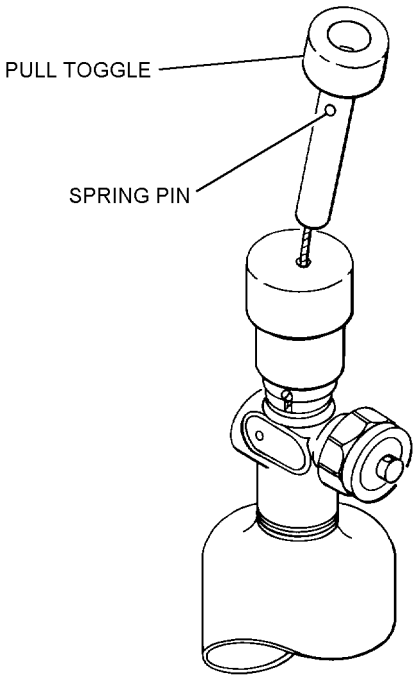
Quantity	Description	Reference Number
As Required	Ink, Black, Waterproof	SPE-92 NIIN 00-161-4229
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
1	Grommet, Type III No. 1	NIIN 00-231-6619

1. Remove CO_2 inflation system (MIL-V-81722) from liferaft. Remove retaining line from inflation assembly.

WARNING

Clamp the CO_2 inflation assembly in a suitable restraining device (vise) when removing the spring pin from the valve pull toggle.

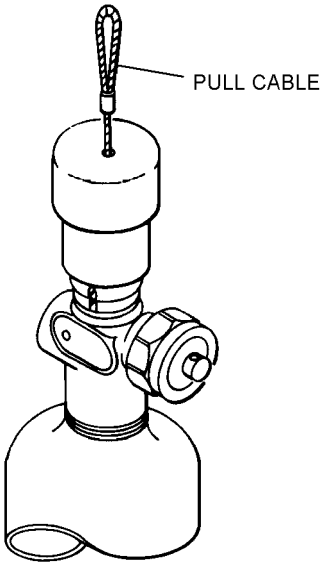
2. Extract spring pin from pull toggle shaft.



D0058002

Step 2 - Para 4-58

3. Remove and scrap pull toggle. Do not remove valve pull cable.



D0058003

Step 3 - Para 4-58

4. Remark new CO_2 inflation assembly tare and gross weights. New weights should be old weights minus 0.03 lb (weight of plastic pull toggle).

5. Mark retaining line at 15 1/2 inches and 16 1/2-inches from the loop end of the line.

6. Fold line at 15 1/2-inch mark, then refold snaphook portion of line back at 16 1/2-inch mark. This will result in three thicknesses of line at 14 1/2 to 15 1/2 inches from loop end.

7. Sew a one-inch boxstitch through the three thicknesses of line.

NOTE

An alternate method of providing three thicknesses of line is to boxstitch two 1-inch lengths of MIL-W-4088, Type II webbing to the retaining line between 14 1/2 and 15 1/2-inch mark (measured from the loop end of retaining line).

8. Install grommet in center of boxstitch.

9. Reinstall CO_2 inflation assembly on liferaft.

10. Pass loop end of retaining line around modified MIL-V-81722 (FLU-6/P) inflation valve at cylinder neck. Pass snaphook end of line through the loop and pull line tight, forming a lark's head knot. Tack lark's head knot with two turns of waxed, nylon 6-cord, single. Tie ends with a surgeon's knot followed by a square knot.

11. Remove and scrap the red arrow patch, with stenciled note "Pull Toggle" from the life raft carrying case.

12. Stencil or print the following note in 1-inch high letters on the carrying case top panel: "PULL YELLOW 6 FT. LANYARD TO INFLATE: CLIP SNAPHOOK TO SELF."

13. Make necessary entries on appropriate form in accordance with OPNAVINST 4790.2 Series.

4-59. MODIFICATION OF THE LR-1 LIFERAFT FLU-6/P TYPE INFLATION VALVE ON RSSK INFLATION SYSTEMS. To modify the LR-1 liferaft inflation assembly equipped with a MIL-V-81722 (FLU-6/P) inflation valve, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Ink, Black, Waterproof	SPE-92 NIIN 00-161-4229

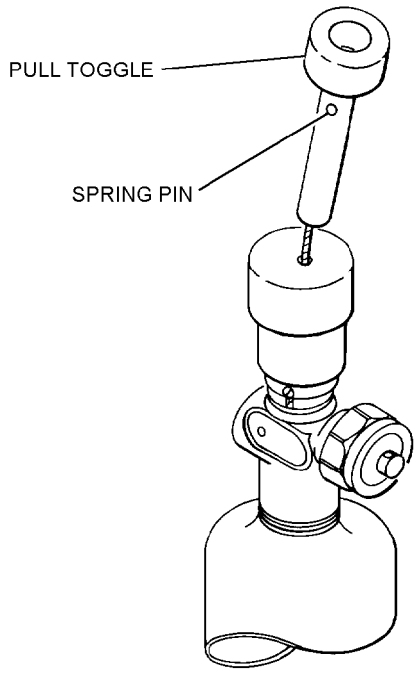
1. Remove the LR-1 liferaft, if stowed.

2. Disconnect and remove the CO_2 inflation assembly (valve and cylinder) from the liferaft. Remove retaining line from inflation assembly.

WARNING

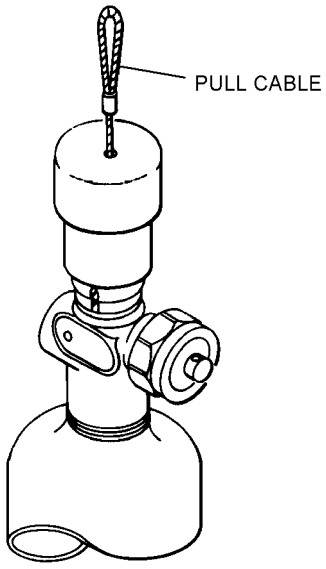
Clamp the CO_2 inflation assembly in a suitable restraining device (vise) when removing the spring pin from the valve pull toggle.

3. Extract and scrap the spring pin from the pull toggle shaft.



Step 3 - Para 4-59

4. Remove and scrap the pull toggle. Do not remove the valve pull cable.



Step 4 - Para 4-59

5. Re-mark the new CO_2 inflation assembly tare and gross weights. New weights should be old weight minus 0.03 lb (weight of plastic pull toggle).

6. Reinstall inflation assembly on liferaft.

7. Rerig and reinstall liferaft in accordance with NAVAIR 13-1-6.3-1 and 13-1-6.3-2 instructions.

NOTE

To preclude tension on the CO_2 valve pull cable, allow slack in the dropline while packing raft.

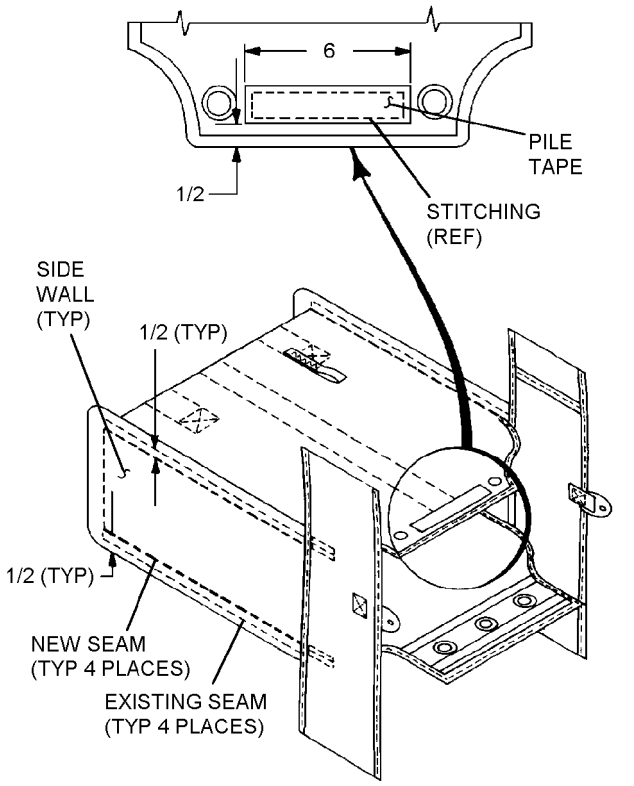
4-60. MODIFICATION OF HIGH SPEED SOFT PACK AND LIFERAFT CYLINDER SLING. To modify the high speed soft pack and cylinder sling for use in T-39 type aircraft, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Cement, Type II, Polychloroprene	MIL-A-5540 NIIN 00-142-9913
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3384
6 inches	Pile Tape, Type I, 1-inch Wide	MIL-F-21840
6 inches	Hook Tape, Type I, 1-inch Wide	MIL-F-21840

1. Remove contents from high speed outer container. Turn container inside out.

2. Sew new side wall seams 1/2 inch from existing side wall seams using 8 to 10 stitches per inch. Turn container right side out and hand sew 6-inch pile tape to inside of cone side flap as shown. Use whipstitch 8 to 10 stitches per inch.



Step 2 - Para 4-60

NOTE

Cementing procedure shall be performed in accordance with the general instructions of paragraph 4-47.

3. Cement 6-inch length of hook tape to carbon dioxide cylinder sling on liferaft so pile tape engages hook tape when liferaft is stowed in container.

4-60A. REPAIR OF HELICOPTER LIFERAFT (LR-1) CARRYING CASE. To repair the liferaft carrying case proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Type I or II, Size E	V-T-295
As Required	Cloth	MIL-C-81543

1. Tears of less than 1 inch shall be darned or repaired with a zigzag stitch.

2. Tears of 1 to 6 inches shall be covered with a patch.

3. Broken stitching shall be repaired by over-stitching 2 inches past the ends of the broken stitches and shall be back–stitched 1 inch.

4. Tears of over 6 inches shall not be repaired.

4-61. REPLACEMENT OF ORAL INFLATION VALVE. To replace the oral inflation valve, proceed as follows:

NOTE

Replacement oral inflation valves can only be obtained through salvage of BCM'ed or surveyed inflatable survival equipment.

Materials Required

Quantity	Description	Reference Number
1	Valve, Oral Inflation	—
As Required	Cement, Polychloroprene	MIL-A-5540 NIIN 00-142-9913
As Required	Brush, Disposable	NIIN 00-514-2417
As Required	Toluene	TT-T-548 NIIN 00-281-2002
	-or-	
	Methyl Ethyl Ketone (MEK)	TT-M-261 NIIN 00-281-2762

CAUTION

Only toluene or MEK shall be used to clean oral inflation valve and tube. Only Polychloroprene cement (MIL-T-5540, NIIN 00-142-9913) shall be used to cement oral inflation valve into oral inflation tube.

1. Carefully cut through metal clamp securing oral inflation valve to oral inflation tube and remove the metal band and oral inflation valve.

2. If the tip of the oral inflation tube was damaged during removal of valve, trim off damaged section.

3. Clean both surfaces to be cemented with toluene or MEK. Allow areas to dry.

4. Using a small disposable brush, carefully apply a small amount of Polychloroprene cement to the surfaces of the tube and the valve which are to be cemented together.

5. Immediately place oral inflation valve into oral inflation tube. Oral inflation valve should be inserted up to valve shoulder. Inspect for proper application and cementing.

6. Tightly wrap the cemented portion of the oral inflation tube with cord or wire and allow to cure for 48 hours before removing wrap.

7. Perform leakage test in accordance with paragraph 4-34.

4-62. PACKING LR-1 LIFERAFT.

4-63. This procedure contains information on packing the LR-1 in the Helicopter Back Pack. Information on packing the LR-1 in the Combination Carrying Case and Equipment Container (used in Standard and Special Soft Packs, High Speed Soft Pack (Modified)) and RSSK assemblies can be found in NAVAIR 13-1-6.3-1. Table 4-8, LR-1 Liferaft Assemblies, lists the LR-1 Liferaft components used on various survival kit and pack assemblies. Packing of the LR-1 liferaft shall be carried out by qualified personnel at the lowest level of maintenance possible.

4-64. PACKING LR-1 LIFERAFT WITH MODIFIED MIL-V-81722 (FLU-6/P) INFLATION VALVE IN HELICOPTER BACK PACK (LR-1 HELO MOD). To pack an LR-1 liferaft with modified MIL-V-81722 (FLU-6/P) inflation valve in a Helicopter Back Pack, proceed as follows:

1. Ensure liferaft and carrying case have been inspected in accordance with paragraph 4-13.

2. Lightly dust entire liferaft assembly with talc (MIL-T-50036A).

3. If necessary, stow sea anchor (see figure 4-11).

4. Deploy weathershield and lay out neatly over top of liferaft.

5. Pass loop end of retaining line around modified MIL-V-81722 (FLU-6/P) inflation valve at cylinder neck. Pass snaphook end of line through the loop and pull knot tight, forming a lark's head knot. Tack lark's head knot with two turns of waxed, nylon 6-cord, single. Tie ends with a surgeon's knot followed by a square knot.

Table 4-8. LR-1 Liferaft Assemblies

Component	Reference Number	LR-1 Applications					
		Standard Soft Pack	High Speed Soft Pack	Rigid Seat Survival Kit	Helicopter Back Pack	Special Assembly	High Speed Soft Pack Modified
		SSP	HSSP	RSSK	HELO	SPECIAL	HSSP MOD
Inflatable One-Man Liferaft	67A318H2-1 (CAGE 30003)	X	X	X	X (Note 1)	X	X (Note 2)
Inflation Valve	FLU-6/P (CAGE 30003)	X	X	-	-	X	X
	FLU-6/P (CAGE 30003) Modified	-	-	X	X	-	-
CO_2 Cylinders	MS26545B2C0020 (CAGE 96906) or MS26545B4C0020 (CAGE 96906) or MS26545B4C0021 (CAGE 96906) or						
SSP Outer Container	68A77D2-1 (CAGE 30003)	X	-	-	-	-	-
HSSP Outer Container	60A116E4 (CAGE 30003)	-	X	-	-	-	X (Note 3)
Survival Package Assembly	472P510E400-1 (CAGE 24632)	-	-	-	-	-	-
Helo Carrying Case	P/N 68A77H1-1 (CAGE 30003)	-	-	-	X	-	-
Special Outer Container	P/N 134F10234-7 (CAGE 26512)	-	-	-	-	X	-
Combination Carrying Case and Equipment Container	P/N 67A77H3-1 (CAGE 30003)	X	-	-	-	X	-
Securing Line (Note 4)	MIL-C-5040 Type III	X	X	-	-	X	-
Retaining Line (Note 5)	P/N 67A319D16 (CAGE 30003)	X	X	X	X	X	X
Survival Items (Note 6)	NAVAIR 13-1-6.5 Rescue and Survival Equipment	X	X	X	-	X	X
Sea Anchor	P/N 67A318H2-13 (CAGE 30003)	X	X	X	X	X	X

Table 4-8. LR-1 Liferaft Assemblies (Cont)

Component	Reference Number	LR-1 Applications					
		Standard Soft Pack	High Speed Soft Pack	Rigid Seat Survival Kit	Helicopter Back Pack	Special Assembly	High Speed Soft Pack Modified
		SSP	HSSP	RSSK	HELO	SPECIAL	HSSP MOD
Sea Anchor	P/N 67A318H2-13 (CAGE 30003)	X	X	X	X	X	X

LEGEND:
X Required On (One type of either item required)
– Not Required

Notes:
(1) Hook tape must be added. Refer to paragraph 4-57.
(2) Hook tape must be added. Refer to paragraph 4-60 and NAVAIR 13-1-6.3-1 and 13-1-6.3-2.
(3) High Speed Soft Pack (Modified) must be fabricated. Refer to paragraph 4-60.
(4) Securing line must be added. Refer to paragraph 4-55.
(5) Retaining line must be added. Refer to paragraph 4-53.
(6) Refer to applicable chapters in NAVAIR 13-1-6.3-1 and 13-1-6.3-2.

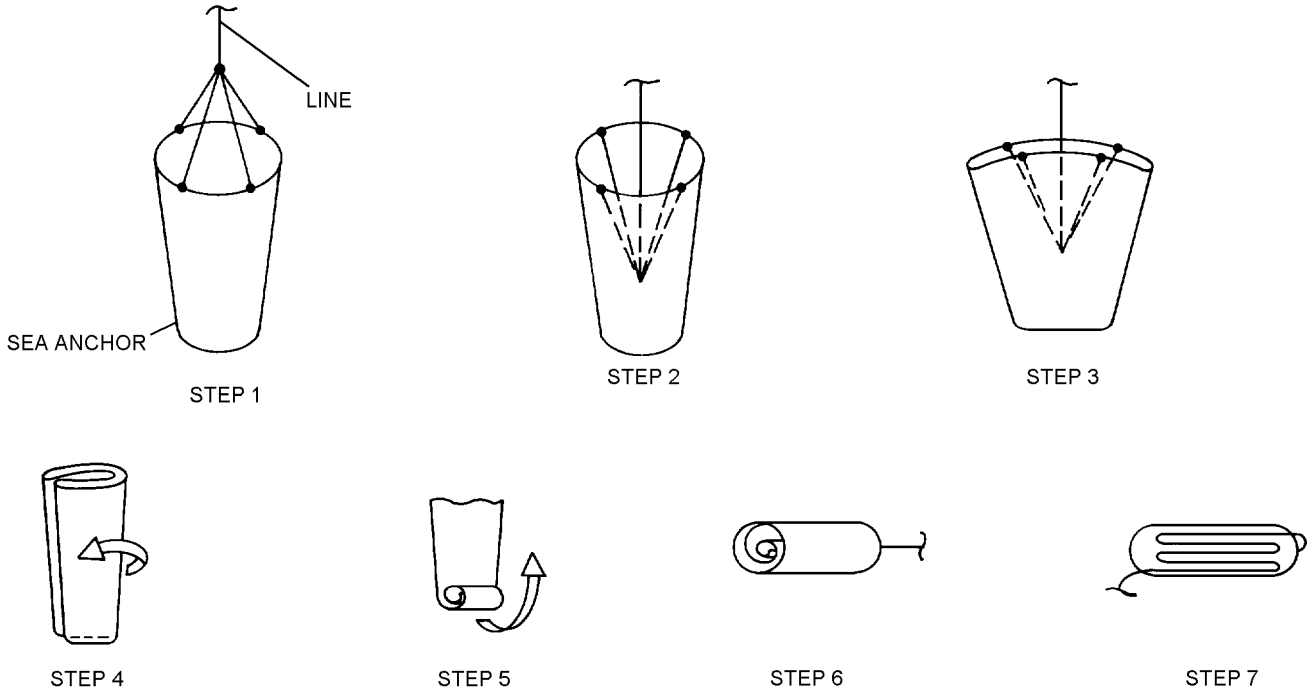


Figure 4-11. Stowing Sea Anchor and Line

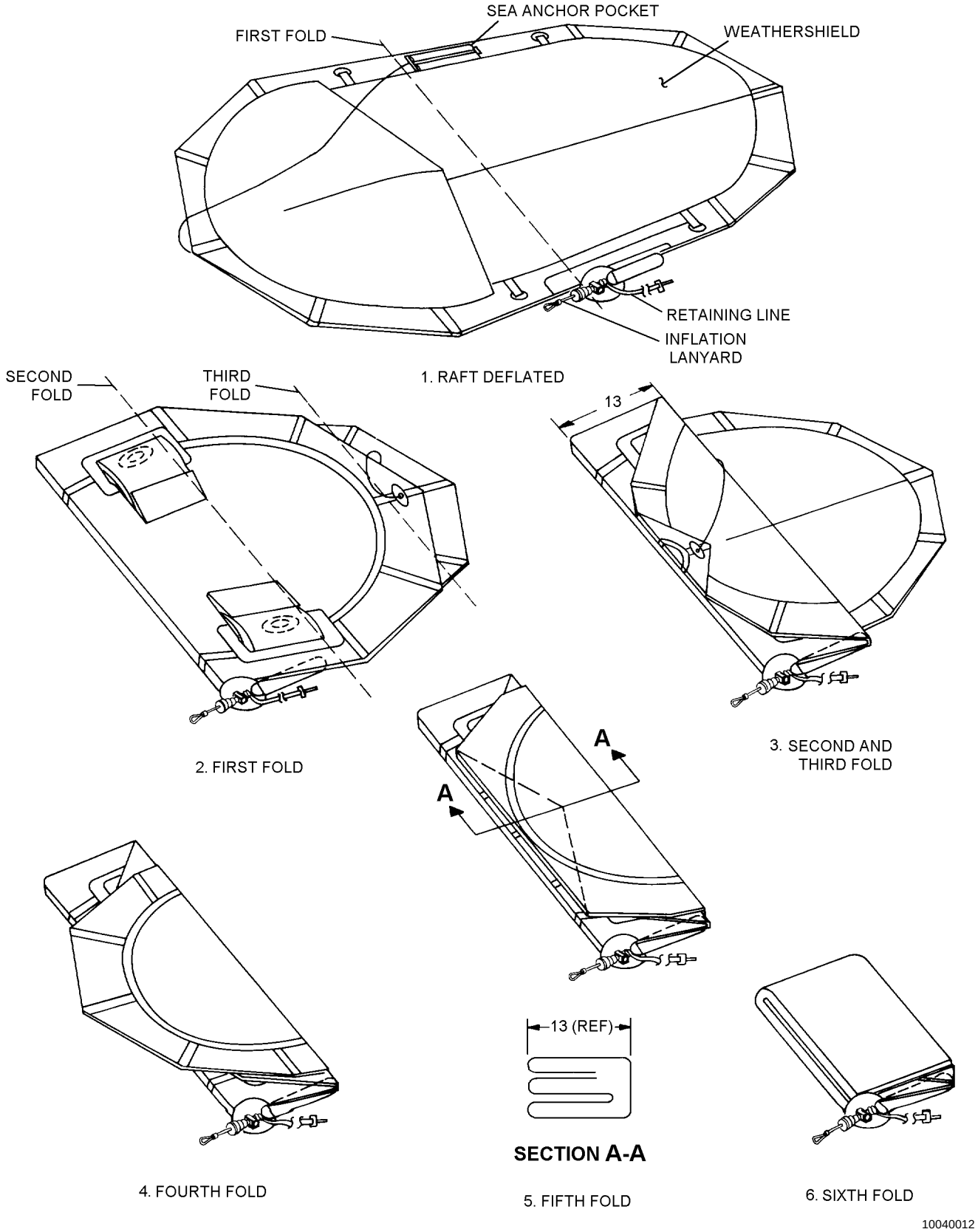


Figure 4-12. Folding LR-1 for Helicopter Back Pack

6. Fold anti-chafing disc around the inflation valve. Ensure oral inflation valve is locked.

7. Fold liferaft in accordance with Figure 4-12.

8. Pass 12-inch length of MIL-V-5040, Type I nylon cord through modified inflation valve pull cable loop and grommet in retaining line. Tie cord with surgeon's knot followed by a square knot, pulling cable loop and grommet tightly together. Cut excess cord and sear ends.

WARNING

Retaining line must have a minimum of three inches slack between lark's head knot around carbon dioxide cylinder and pull cable loop tie-down when retaining line is pulled sufficiently to place tension on the pull cable. This slack is necessary to ensure actuation of the inflation assembly when the retaining line is pulled.

9. Fake the retaining line in 6-inch bights. Secure the line with a rubber band.

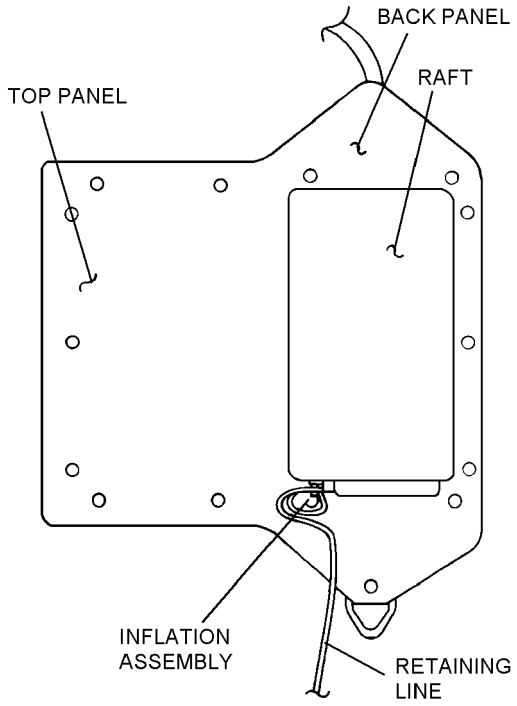
10. Place the carrying case on the table so that panels are open and the inside is facing up.

11. Place folded liferaft on the carrying case back panel so that inflation valve pull cable is toward centerline.

12. Secure the snap fastener on end of retaining line to mating fastener on lower end of back panel. Safety tie the retaining line snaphook to the grommet in lower panel with two turns of V-T-295, size E, single nylon thread. Tie ends with surgeon's knot, followed by a square knot.

13. Place remaining portion of the retaining line under the CO_2 cylinder. Ensure that the inflation valve pull cable is bent inboard.

14. Mate hook tape on cylinder sling with pile tape on lower flap.



Step 11 - Para 4-64

15. Place protective flaps over the raft.

16. Fold top panel over the back panel and raft. Secure all snap fasteners and hook and pile tapes.

17. Make necessary entries on appropriate form in accordance with OPNAVINST 4790.2 Series.

Section 4-4. Illustrated Parts Breakdown (IPB)

4-65. GENERAL.

4-66. This section lists and illustrates the assemblies and detail parts associated with the LR-1 Liferaft Assembly.

4-67. The Illustrated Parts Breakdown should be used during maintenance when requisitioning and identifying parts.

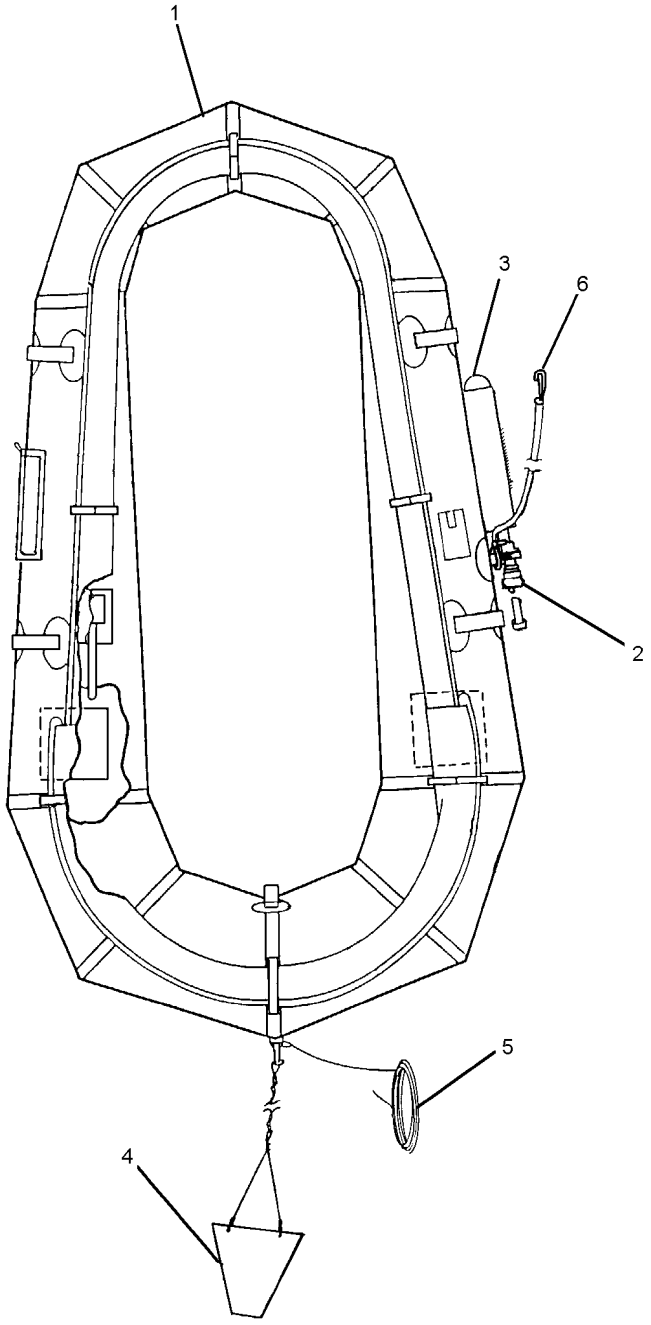


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Figure 4-13. LR-1 Liferaft Illustrated Parts Breakdown

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
4-13		LR-1 LIFERAFT ASSEMBLY	REF	
-1	67A318H2-1	INFLATABLE ONE-MAN LIFERAFT	1	
-2	FLU-6/P	. INFLATION VALVE	1	
-3	MS26545B2C0020	. CO_2 CYLINDER	1	
	MS26545B4C0020	. CO_2 CYLINDER	1	
	MS26545B4C0021	. CO_2 CYLINDER	1	
-4	67A318H2-13	. SEA ANCHOR	1	
-5	MIL-C-5040 TYPE III	. SECURING LINE	1	
-6	67A319D16	. RETAINING LINE	1	

NUMERICAL INDEX

Part Number	Figure and Index Number	SM&R Code
FLU-6/P	4-13-2	
MIL-C-5040	4-13-5	PAOZZ
MS26545B2C0020	4-13-3	PAOZZ
MS26545B2C0020	4-13-3	PAOZZ
MS26545B2C0021	4-13-3	PAOGG
67A318H2-1	4-13-1	PAOGG
67A318H2-13	4-13-4	PAOZZ
67A319D16	4-13-5	PAOZZ